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Factors affecting patients' trust and confidence in GPs - Evidence from the English national GP Patient Survey

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Abstract

Objectives

Patients' trust in General Practitioners (GPs) is fundamental to delivering effective clinical encounters. Associations between patients' trust and their perceptions of communication within the consultation have been identified, but the influence of patients' demographic characteristics on these associations is unknown.

We aimed to investigate the relative contribution of patient age, gender and ethnicity in any association between patients' ratings of interpersonal aspects of the consultation and their confidence and trust in the doctor.

Design

Secondary analysis of English national GP patient survey data (2009)

Setting

Primary Care, England, UK.

Participants

Data from year 3 of the GP patient survey: 5,660,217 questionnaires sent to patients aged 18 and over who had been registered with a general practice in England for at least six months; overall response rate 42% after adjustment for sampling design.

Outcome measures

We used binary logistic regression analysis to investigate patients' reported confidence and trust in the GP, analysing ratings of seven interpersonal aspects of the consultation, controlling for patient sociodemographic factors. Further modelling examined the

moderating effect of age, gender and ethnicity on the relative importance of these seven predictors.

Results

Amongst 1.5 million respondents (adjusted response rate 42%), the sense of 'being taken seriously' had the strongest association with confidence and trust. The relative importance of the seven inter-personal aspects of care was similar for men and women. Non-white patients accorded higher priority to being given enough time than did white patients. Involvement of older patients in decisions regarding their care had a greater effect than amongst younger patients.

Conclusion

Associations between patients' ratings of interpersonal aspects of care and their confidence and trust in their GP are influenced by patients' demographic characteristics. Taking account of these findings could inform patient-centred service design and delivery and potentially enhance patients' confidence and trust in their doctor.

Article focus

- There are associations between patients' trust in their GP and a patient-centred approach to consultations.
- This study adds depth by considering the effect of age, gender and ethnicity on the relationship between interpersonal aspects of the consultation and patients' trust.

Key messages

- Interpersonal aspects of the consultation rated in the survey were strongly associated with reported confidence and trust in the doctor, the strongest association being with 'taking your problems seriously'.
- The relative contribution of other aspects of the consultation to reported confidence and trust varied with the age and ethnicity of the patient.
- Our observation that a sense of shared decision making was a stronger determinant of confidence and trust amongst older patients is a new finding.
- Our findings provide the potential opportunity for targeting patient care to the individual in an informed way.

Strengths and weaknesses

- No previous studies have investigated the interaction effects of patient characteristics and interpersonal aspects of the consultation on confidence and trust in such a large sample of patients in the UK.
- Inclusion and exclusion criteria, outcome measures, and the potential for selection bias, were affected by using pre-determined data. However large actual numbers of completed responses, even in under-represented subgroups, were sufficient to make precise estimates of associations.
- We did not have detailed information about the doctors being commented on, patient health status, or continuity of care. However, data relate to one particular doctor-patient interaction, allowing a focused interpretation of aspects of the consultation.

Factors affecting patients' trust and confidence in GPs - analysis of survey data

Background

Trust is central to all human relationships[1] and, in the context of a setting characterised by vulnerability such as in a clinical consultation, may be considered as the belief of the individual placing their trust that the trustee will care for their best interests.[2] As a component of the doctor-patient relationship[3,4] trust stems from patient beliefs that the doctor is their ally and is competent in both clinical and interpersonal skills.[5] Patients' trust in their General Practitioner (GP) underpins the delivery of effective clinical encounters.[2, 6, 7] Whilst patient's trust and confidence in GPs is high,[6] GPs in England and Wales have adopted a central role in commissioning primary health care, and in this context, the preservation of patients' confidence and trust will play a vital part in supporting future service developments.[2, 8]

Numerous benefits may accrue from a trusting, confident doctor-patient relationship. These include the open communication of information between doctor and patient, with subsequent encouragement of patient enablement and improved adherence to medical advice;[6,9,10] the reduction in rates of referral with associated cost reductions;[2]and the improvement of health outcomes and better patient perceptions of health care.[11]

The development of a trusting doctor-patient relationship is facilitated by a range of organisational and personal factors such as patient-centred approaches to care[11,12]and improved communication;[13-16] shared decision making;[17-19] increased consultation length;[20] interpersonal continuity of care [21-23] and providing support without necessary expectation of cure;[24]giving patients a choice of doctor;[25,26]congruence in doctor-patient beliefs,[27,28]and ethnicity,[29] and patient approval of the doctor's appearance.[30]

Whilst previous research has investigated associations between age, gender and ethnicity of the patient and their expression of confidence and trust in a doctor, the relative contribution and interaction of these factors with patient perceptions of the consultation remains unknown. To address this shortcoming we investigated the influence of these interactions using data from the English GP Patient Survey (GPPS) undertaken in 2009. [31, 32]

We aimed to investigate the relative contribution of patient age, gender and ethnicity in any observed association between patients' ratings of interpersonal aspects of the consultation and their reported confidence and trust in the doctor.

Methods

Data were extracted from year 3 (January to March 2009) of the GP patient survey during which 5,660,217 questionnaires were sent to patients aged 18 years and over who had been continuously registered with a general practice in England for at least six months. The overall response rate was 42% after adjustment for sampling design.[32] The year 3 GPPS data was not weighted, as associations were expected to be less vulnerable to the effect of non-response, unlike prevalence estimates where weighting is essential. A detailed account of the survey methodology is reported elsewhere.[31]

One item (Q20) of the GP patient survey invited patients to rate their most recent consultation with a doctor at the practice in respect of seven interpersonal aspects of care ('Giving you enough time', 'Asking about your symptoms', 'Listening to you', 'Explaining tests and treatments', 'Involving you in decisions about your care', 'Treating you with care and concern' and 'Taking your problems seriously') using a five point scale (5= very good to 1= very poor). The next item (Q21) invited respondents to rate their confidence and trust in the doctor they had seen using a three point scale ('yes definitely', 'yes to some extent', 'no not at all'). Only 3% of individuals expressed no confidence in the doctor they had consulted. For this reason responses to this item were

dichotomised into 'definite' versus 'partial or no' confidence and trust for the purposes of regression analysis. Patients were asked to report their gender, age (eight categories: 18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, and 85 years and over), ethnicity (sixteen categories), and health status (five categories: Poor, Fair, Good, Very good, and Excellent). Patient postcodes were used to attach data on rurality (two categories: Inner city and Elsewhere) and socio-economic deprivation (in quintiles).[33] Our main analyses used only respondents with informative responses to all parts of Q20, Q21 and complete data on the six demographic variables. Therefore we compared these respondents with those with incomplete data in respect of gender, age, ethnicity and definite confidence and trust in the doctor.

Binary logistic regression was used throughout to model the average effect of a one point increase in the patient's rating of the interpersonal aspects of care on the odds of reporting definite confidence and trust in the doctor. Initially, a 'main effects' model was used to determine the effects (odds ratios) associated with patient age, gender, ethnicity and the seven ratings of interpersonal aspects of the consultation. The null hypothesis, that the odds ratios were equal for the seven 'interpersonal' ratings was tested using a likelihood ratio test and the odds ratios were then ranked in order of size. In estimating the 'average effect of a one point increase' in any of the 'interpersonal' ratings on the odds of reporting definite confidence and trust we were assuming each of the ratings to be approximately linearly related to the log odds. We verified the reasonableness of this assumption using simple linear regressions of the observed log odds on each of the ratings (results not shown).

We noted that the rank order of the contribution of the seven 'interpersonal' ratings followed almost exactly the order that the items appear in the survey questionnaire. Since these items (question 19a-g) immediately precede the question addressing confidence and trust (question 20), we explored the possibility of a question ordering effect by regressing a later item reflecting 'overall satisfaction with care at the surgery' (question 25), on the 'interpersonal' items, along with the sociodemographic variables.

A second 'interaction model' was used to establish the moderating effects of age, gender and ethnicity on the effects of the seven 'interpersonal' ratings. To facilitate easy comparisons, the odds ratios for the effect of a one point increase in each rating of the consultation on having definite confidence and trust in the doctor, were estimated and ranked in order of size for various age, gender and ethnic subgroups by combining the appropriate main and interaction terms. To simplify interpretation of the results, patient age was categorised into three groups (18-35, 35-64, 65 years and over) and ethnicity was dichotomised (white, non-white) to create 12 (=2×3×2) gender by age by ethnicity subgroups. The original categorisation of the data would have created 256 such subgroups and made interpretation too complex.

Both regression models controlled for patients' health status, rurality, and socio-economic deprivation and incorporated a random effect to account for clustering of the data by practice. We were unable to account for clustering by doctor as the GP patient survey does not ask patients to identify the individual doctor being rated. All analyses were performed in STATA version SE10.1 for Windows.

Results

Of 2,163,456 patients in the sample, 296,066 (14%) had indicated that one or more of the aspects of the consultation were not relevant to the last time they had seen the doctor. Although these data were treated as missing in our analysis they should be considered 'missing by design'. A further 391,138 (18%) of patients had truly missing data, leaving an effective sample size for analysis of 1,476,252 (26% of the 5,660,217 patients who were originally sent questionnaires). Individuals with complete data differed from those with incomplete data: more of them were male (44% vs. 38%), more were in the middle age groups (56% vs. 49% aged 35-64 years), slightly more were white (87% vs. 86%) and more reported definite confidence and trust in the doctor (73% vs. 69%). Although statistically significant due to the large sample size ($p<0.001$ in all cases), these differences are fairly small.

Whilst similar proportions of men and women reported definite confidence and trust in the doctor (74% vs. 73% respectively), definite confidence and trust was more commonly reported by older patients than by younger patients (Table 1); by patients from white ethnic backgrounds than by non-white patients (75% vs. 61% respectively); by patients living outside inner-city areas compared with those from inner-city areas (79% vs. 72%); by those reporting excellent health compared with those reporting poor health (82% vs. 71%); and among those in areas of low deprivation compared with those in areas of high deprivation (77% vs. 69%). Ratings of the seven interpersonal aspects of care were strongly skewed towards favourable responses: 82-90% of responses were 'Good' or 'Very good'.

The main effects binary logistic regression model, predicting the odds that a patient reported definite confidence and trust in the doctor, is shown in Table 2. Although increases in all seven inter-personal aspects of care predicted increased confidence and trust, the odds ratios associated with these seven aspects differed significantly (likelihood ratio test, $p<0.0001$). The sense of problems having been taken seriously was the strongest predictor, increasing the odds of expressing confidence and trust almost threefold. More modest effects were evident in respect of treating the patient with care and concern, of explaining tests and treatments, and of involving the patient in decisions regarding their care. The sense of having been given enough time increased the same odds by only around 20%.

In investigating item ordering effects, the order of influence of the proximate items was observed to be similar to the more distant items, with the exception that 'giving you enough time' was ranked second (results not shown). The proximity of questions in presentation therefore did not appear to be a major determinant of their rank order of predictive influence.

Table 3 shows the odds ratios, derived from the logistic regression 'interaction' model, for the effect of a one point increase in each rating of the consultation on reporting definite confidence and trust in the doctor. The complete regression model, along with confidence intervals and the method of deriving the odds ratios shown in Table 3, is included as a web appendix. The rank order of the estimated odds ratios highlights the relative influence of the seven aspects of the consultation on reporting definite confidence and trust. The dominance of having problems taken seriously is evident throughout the rankings. The rank orders of the contribution of the seven inter-personal aspects of care were similar for men and women. However, non-white patients, particularly those in the oldest age group, accorded higher priority to being given enough time during the consultation than did white patients. A notable difference was observed for patients aged 35 or less, who accorded lower ranking to being involved in decisions regarding their care than did older patients.

Discussion

Summary of main findings

A substantial majority of GP patient survey respondents expressed definite confidence and trust in their GP. Patients' confidence and trust in the doctor increased with patient age, was similar for males and females, and was reported more frequently by those of white ethnicity. For all items relating to interpersonal aspects of the consultation, higher patient ratings were associated with an increased likelihood of reporting confidence and trust. Confidence and trust was most strongly associated with patients' perceptions of having their problems taken seriously.

There was no appreciable difference between men and women in respect of the relative importance of aspects of the consultation as potential predictors of confidence and trust in their doctor. However, we observed some differences between patients in different age

and ethnic groups: As age increases, patients who report greater trust appear to particularly value being involved in decisions about their care; non-white patients, particularly those aged 65 or more, placed particular value on being given enough time during their consultations. The identification of some immutable patient characteristics associated with systematic variation in patient's confidence and trust provides the potential opportunity for targeting patient care in an informed way – for example by actively engaging older patients in decisions about their care.

Strengths and limitations of the study

We conducted a secondary analysis of data from a major national survey involving a large sample of patients. The inclusion and exclusion criteria and outcome measures were limited by using pre-determined data, however the data set was large and varied enough to answer the questions posed. No previous studies have investigated the interaction effects of patient characteristics and interpersonal aspects of the consultation on confidence and trust in such a large sample of patients in the UK.

The adjusted survey response rate was 42%, with younger patients, non-white patients, and those living in areas of socioeconomic deprivation being under-represented amongst respondents.[33] This under-representation was comparable to similar surveys conducted elsewhere in the world. A study of key measures within the GP patient survey found no evidence of non-response bias.[32] Individuals with complete data differed from those with incomplete data. However, although statistically significant, these differences were small. We therefore recognise the potential for selection bias in our data, although believe that our results might reasonably reflect the wider UK population. The large actual numbers of completed responses, even in under-represented subgroups, were sufficient to make precise estimates of associations.

We noted that the order in which the aspects of the consultation were presented in the patient questionnaire matched the general rank order of the estimated odds ratios for the relative contribution of aspects of the consultation to reporting definite confidence and

trust. Whilst the variation in this rank ordering amongst different patient subgroups, together with our results regarding the 'overall satisfaction' item suggest otherwise, it remains possible that question-ordering effects are important. Such effects could be tested in future by altering the item order.

We did not have access to detailed information about the doctors or practices being commented on, and are therefore unable to assess the contribution of these factors in determining confidence and trust. Similarly, although previous research has suggested that patient health status may be of importance,[5,34] detailed information was not available to us within this dataset. It was not possible to tell if patients were referring to their usual doctor when responding to questions regarding the 'last time you saw a doctor'. Conclusions therefore, could not be drawn about continuity of care. However, data relate to one particular doctor-patient interaction, allowing a focused interpretation of aspects of the consultation within that particular consultation.

Comparison with existing literature

The association of patients' confidence and trust with increasing age and with white ethnicity, has been previously reported.[6] Our findings add depth to the current literature by considering the moderating effect of age, gender and ethnicity on the relationship between interpersonal aspects of care reflected in a recent consultation, and patients' confidence and trust in the doctor.

Previous research has highlighted associations between patients' confidence and trust and several interpersonal aspects of the doctor-patient relationship within the consultation. This includes the importance to patients of effective communication,[17] a sense of partnership between doctor and patient,[35] and the patient's perception of being given enough time during the consultation.[36] However, our observation that a sense of shared decision making was a stronger determinant of confidence and trust amongst older patients is a new finding. This contrasts with previous literature which has suggested that older patients may prefer a focus on receiving information rather than on active

participation.[37,38] One explanation might be that this reflects a changing culture in which older people have a greater awareness of available healthcare, through media coverage for example. They may therefore feel more willing to be involved in decisions about which they have a prior awareness. It may also reflect a more holistic approach by doctors to support patients' involvement. The contributions of trust and of shared decision making in patients' evaluations of health services have previously been considered separately.[39] Our findings, although based on cross sectional data with acknowledged potential for bias, suggest these factors are related and their effect on patients' perceptions and evaluations of health services are likely to be confounded.

Implications for future research and clinical practice

A number of the determinants of confidence and trust in doctors reported in our study would benefit from further investigation using qualitative approaches, including further exploration of patient perceptions of their problems being taken seriously. Such approaches might be beneficial in informing primary health care delivery and planning. Providing services that are responsive to the needs and aspirations of an ageing population,[40] in respect of confidence and trust, might involve doctors routinely engaging in shared decision making with older patients during consultations. Highlighting of these issues in relevant undergraduate and postgraduate educational and training fora might be appropriate.

We have shown that the interpersonal aspects of the consultation rated in the survey were strongly associated with reported confidence and trust in the doctor, the strongest association being with 'taking your problems seriously'. The relative contribution of other aspects of the consultation to reported confidence and trust varied with the age and ethnicity of the patient. Incorporating these findings in delivering routine care has the potential to support a patient-centred approach to care, tailored to the patient as an individual.

Ethics

The Central Office for Research Ethics Committee (COREC) advised that the survey does not require formal medical research ethical approval but it adheres to the Market Research Society code of ethics

Conflicts of interest

Nil

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Department of Health

Contributors

JEC was responsible for planning the study, drafting and finalising the manuscript. DRS critically revised the manuscript. MJR, GA and JEC interpreted the data and participated in critical review. MR also provided critical review. JLC was responsible for supervision, aided in interpretation of data and also critically revised the manuscript.

Data Sharing

No additional unpublished data are available.

References

1. Mascarenhas, O., et al., *Hypothesized predictors of patient-physician trust and distrust in the elderly: implications for health and disease management.* Clinical Interventions in Ageing, 2006. **1**(2): p. 175-188.
2. Hall, M., et al., *Trust in Physicians and Medical Institutions: What Is It, Can It Be Measured, and Does It Matter?* The Milbank Quarterly, 2001. **79**(4): p. 613-639.
3. Peabody, F., *The Care of the Patient.* Journal of the American Medical Association, 1927. **88**: p. 877-882.
4. Ridd, M., et al., *The patient-doctor relationship: a synthesis of the qualitative literature on patients' perspectives.* British Journal of General Practice, 2009. **59**: p. 268-275.
5. Mechanic, D. and Meyer, S.*Concepts of trust among patients with serious illness.* Social Science & Medicine, 2000. **51**(5): p. 657-668.
6. Tarrant, C.S., Stokes, T. Baker, R., *Factors associated with patients' trust in their general practitioner: a cross-sectional survey.* British Journal of General Practice, 2003. **53**: p. 798-800.
7. Fugelli, P., *Trust - in general practice.* British Journal of General Practice, 2001. **51**: p. 575-579.
8. Platonova, E.A., *Understanding Patient Satisfaction, Trust, and Loyalty to Primary Care Physicians.* Medical Care Research and Review, 2008. **65**(6): p. 696-712.
9. Little, P., et al., *Observational study of effect of patient centredness and positive approach on outcomes of general practice consultations.* British Medical Journal, 2001. **323**: p. 908-911.
10. Thom, DH., et al., *Further validation and reliability testing of the trust in physicians scale*. Medical Care, 1999. **37**: p. 510-7.
11. Safran, DG., et al., *Linking Primary Care Performance to Outcomes of Care*. Journal of Family Practice, 1998. **47**(3): p. 213–20.
12. Fiscella, K., et al., *Patient trust: is it related to patient-centred behaviour of primary care physicians?* Medical Care, 2004. **42**(11): p. 1049-1055.

13. Thom, D., *Physician behaviors that predict patient trust.* Journal of Family Practice, 2001. **50**(4): p. 323-328.
14. Ogden, J., et al., *What's in a name? An experimental study of patients' views of the impact and function of a diagnosis.* Family Practice, 2003. **20**(3): p. 248-253.
15. Burkitt Wright, E., Holcombe, C., and Salmon, P.,*Doctors' communication of trust, care, and respect in breast cancer: qualitative study.* British Medical Journal, 2004. **328**. 864. doi: http://dx.doi.org/10.1136/bmj.38046.771308.7C
16. Edwards, A., et al., *Patient-based outcome results from a cluster randomized trial of shared decision making skill development and use of risk communication aids in general practice.* Family Practice, 2004. **21**(4): p. 347-354.
17. Ommen, O.T.,Holger, S.P.,Janssen, C., *The relationship between social support, shared decision-making and patient's trust in doctors: a cross-sectional survey of 2,197 inpatients using the Cologne Patient Questionnaire.* Int J Public Health, 2010. **56**(319-327).
18. Cohen, D., et al., *Resource effects of training general practitioners in risk communication skills and shared decision making competences.* Journal of Evaluation in Clinical Practice, 2004. **10**(3): p. 439-445.
19. Edwards, A. and Elwyn, G.,*Involving patients in decision making and communicating risk: A longitudinal evaluation of doctors' attitudes, and confidence during a randomized trial.* Journal of Evaluation in Clinical Practice, 2004. **10**(3): p. 431-437.
20. Freeman, G., et al., *Evolving general practice consultation in Britain: issues of length and context.* British Medical Journal, 2002. **324**: p. 880-882.
21. Mainous, A., et al., *Continuity of Care and Trust in One's Physician: Evidence From Primary Care in the United States and the United Kingdom.* Family Medicine, 2001. **33**(1): p. 22-27.
22. Pereira Gray, D., et al., *Towards a theory of continuity of care.* Journal of the Royal Society of Medicine, 2003. **96**: p. 160-166.
23. Tarrant, C., *Continuity and Trust in Primary Care: A Qualitative Study Informed by Game Theory.* Annals of Family Medicine, 2010. **8**(5): p. 440-446.

24. Cocksedge, S.G., Nugent, R., Kelly, G., Chew-Graham, C., *Holding relationships in primary care: a qualitative study of doctors' and patients' perceptions.* British Journal of General Practice, 2011. **61**(568):e484-91. doi 10.3399/bjgp11X588457.

25. Kao, A., et al., *Patients' Trust in Their Physicians. Effects of Choice, Continuity, and Payment Method.* Journal of General Internal Medicine, 1999. **13**: p. 681-686.

26. Chu-Weininger, M., and Balkrishnan, R.,*Consumer satisfaction with primary care provider choice and associated trust.* BioMed Central Health Services Research, 2006. **6**: p. 139-152.

27. Staiger, T., et al., *Brief Report: Patient-Physician Agreement as a Predictor of Outcomes in Patients with Back Pain.* Journal of General Internal Medicine, 2005. **20**: p. 935-937.

28. Krupat, E., et al., *When Physicians and Patients Think Alike: Patient-Centred Beliefs and Their Impact on Satisfaction and Trust.* Family Practice, 2001. **50**(12): p. 1057-1062.

29. Tarn, D., et al., *Trust in One's Physician: The Role of Ethnic Match, Autonomy, Acculturation, and Religiosity Among Japanese and Japanese Americans.* Annals of Family Medicine, 2005. **3**(4): p. 339-347.

30. McKinstry, B. and Wang, J.X.,*Putting on the style: what patients think of the way their doctor dresses.* British Journal of General Practice, 1991. **41**: p. 275-278.

31. Campbell, J., et al., *Development of the national GP Patient Survey for use in primary care in the National HealthService in the UK.* BMC Family Practice, 2009. **10**(57).doi:10.1186/1471-2296-10-57

32. Roland, M., et al., *Reliability of patient responses in pay for performance schemes: analysis of national General Practitioner Patient Survey data in England.* British Medical Journal, 2009. **339**(7727): p. 955.

33. Department of communities and local government. *The English indices of deprivation* [internet] 2007. (Updated; cited 16 July 2012). Available from: http://www.communities.gov.uk/documents/communities/pdf/576659.pdf

34. Thorne, SE., Robinson, CA., *Guarded alliance: health care relationships in chronic disease.* Image J Nurse Sch, 1989. 21(3): p. 153-7.

35. Little, P., et al., *Preferences of patients for patient centred approach to consultation in primary care: observational study.* British Medical Journal, 2001. **322**: p. 1-7.

36. Skirbekk, H.M., Hjortdahl, AL., Per., Arnstein, F.,*Mandates of Trust in the Doctor-Patient Relationship.* Qualitative Health Research, 2011. **21**(9): p. 1182-1190.

37. Bastiaens, H.V.R., Pavlic, P., Raposo, DR., Baker, R., *Older people's preferences for involvement in their own care: a qualitative study in primary health care in 11 European countries.* Patient Educ Couns, 2007. **68**(1): p. 33-42.

38. Levinson, W.K., Kuby, A., Thisted, RA., *Not all patients want to participate in decision making. A national study of public preferences.* J Gen Intern Med, 2005. **20**(6): p. 531-5.

39. Joffe, S., et al., *What do patients value in their hospital care? An empirical perspective on autonomy centred bioethics.* Journal of Medical Ethics, 2003. **29**: p. 103-108.

40. UK National Statistics. *Topic guide to: Older People* [internet] 2012. (Updated 1 Sep 2012; cited 9 Jan 2012). Available from: http://www.statistics.gov.uk/hub/population/ageing/older-people

Table1.Sociodemographic profile of analysis sample and percentage of each subgroup reporting no confidence, partial confidence or definite confidence and trust in the doctor.

Subgroup	N	% of sample	Did you have confidence and trust in the doctor you saw? No not at all (% of subgroup)	Yes to some extent (% of subgroup)	Yes definitely (% of subgroup)
Gender					
Male	651,163	44	3	23	74
Female	825,089	56	4	24	73
Age (years)					
18-24	70,435	5	7	34	60
25-34	157,753	11	7	33	60
35-44	234,768	16	5	27	68
45-54	274,851	19	4	25	71
55-64	314,986	21	3	22	76
65-74	246,692	17	1	17	81
75-84	140,851	10	1	16	83
85and over	35,916	2	1	16	82
Ethnic group					
White	1,279,862	87	3	22	75
Mixed	10,069	1	6	31	63
Asian / Asian British	79,512	5	6	35	59
Black / Black British	38,131	3	4	30	65
Chinese	6,657	<1	6	43	51
Other	62,021	4	7	32	62
Health status					
Poor	86,597	6	6	23	71
Fair	293,071	20	4	26	70
Good	537,337	36	3	26	71
Very good	429,332	29	3	22	76
Excellent	129.925	9	3	16	82
Locality					
Non-inner city	281,949	19	2	19	79
Inner city	1,194,303	81	4	25	72
Deprivation					
Lowest	267,414	18	2	21	77
Next lowest	291,191	20	3	21	76
Middle	296,938	20	3	23	74
Next highest	298,096	20	4	25	71
Highest	322,613	22	5	26	69
All	1,476,252	100	3	24	73

Table 2. Odds ratios (95% confidence interval) for the 'main effects' binary logistic regression model predicting definite confidence and trust in the doctor.

	Odds Ratio	(95% CI)
Ratings of last consultation		
Q20a Giving you enough time	1.19	(1.18, 1.21)
Q20b Asking about your symptoms	1.26	(1.24, 1.28)
Q20c Listening to you	1.38	(1.36, 1.40)
Q20d Explaining tests and treatments	1.56	(1.55, 1.58)
Q20e Involving you in decisions about your care	1.51	(1.49, 1.52)
Q20f Treating you with care and concern	1.60	(1.57, 1.62)
Q20g Taking your problems seriously	2.86	(2.82, 2.89)
Patient sociodemographic factors		
Female (ref Male)	0.90	(0.89, 0.91)
Age35-64 years (ref age <35 years)	1.27	(1.25, 1.29)
Age65 years &over (ref age <35 years)	1.60	(1.58, 1.63)
Non-white ethnic group (ref White)	0.89	(0.88, 0.91)
Health status	1.12	(1.12, 1.13)
Inner city setting (ref non-inner city setting)	0.95	(0.93, 0.96)
Deprivation	0.98	(0.98, 0.99)

Table 3. Odds ratios for the effect of a one point increase in patient ratings of interpersonal aspects of the consultation on the odds of having definite confidence and trust in the doctor, by patient age, gender and ethnicity. The odds ratios within each patient subgroup are ranked in the lower half of the table.

			age<35				age35-64				age65+			
			White		Non-White		White		Non-White		White		Non-White	
	Consultation aspects	All patients*	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Odds Ratios	Giving you enough time	1.19	1.17	1.11	1.38	1.31	1.15	1.09	1.36	1.29	1.33	1.26	1.56	1.48
	Asking about your symptoms	1.26	1.25	1.25	1.14	1.14	1.28	1.27	1.17	1.16	1.31	1.30	1.19	1.19
	Listening to you	1.38	1.42	1.41	1.30	1.30	1.41	1.40	1.29	1.29	1.35	1.35	1.24	1.24
	Explaining tests and treatments	1.56	1.55	1.56	1.38	1.39	1.61	1.62	1.44	1.45	1.56	1.56	1.39	1.40
	Involving you in decisions about your care	1.51	1.38	1.38	1.25	1.25	1.56	1.56	1.42	1.42	1.58	1.58	1.43	1.44
	Treating you with care and concern	1.60	1.59	1.58	1.60	1.59	1.61	1.60	1.63	1.62	1.56	1.55	1.58	1.57
	Taking your problems seriously	2.86	2.64	2.78	2.25	2.37	2.95	3.11	2.51	2.64	2.89	3.04	2.45	2.58
Rank of Importance **	Giving you enough time	7	7	7	4	4	7	7	5	5	6	7	3	3
	Asking about your symptoms	6	6	6	7	7	6	6	7	7	7	6	7	7
	Listening to you	5	4	4	5	5	5	5	6	6	5	5	6	6
	Explaining tests and treatments	3	3	3	3	3	2	2	3	3	4	3	5	5
	Involving you in decisions about your care	4	5	5	6	6	4	4	4	4	2	2	4	4
	Treating you with care and concern	2	2	2	2	2	3	3	2	2	3	4	2	2
	Taking your problems seriously	1	1	1	1	1	1	1	1	1	1	1	1	1

* Odds ratios taken from table 2

** 1 = most influential, 7 = least influential

Table A1: Odds ratios (95% confidence interval) for a binary logistic regression model predicting definite confidence and trust in the doctor and which includes interactions between age, gender and ethnicity and patients' ratings of interpersonal aspects of the consultation.

	Odds Ratio	(95% CI)
Ratings of last consultation		
Q20a Giving you enough time	1.17	(1.14, 1.21)
Q20b Asking about your symptoms	1.25	(1.21, 1.30)
Q20c Listening to you	1.42	(1.37, 1.47)
Q20d Explaining tests and treatments	1.55	(1.50, 1.60)
Q20e Involving you in decisions about your care	1.38	(1.34, 1.42)
Q20f Treating you with care and concern	1.59	(1.53, 1.64)
Q20g Taking your problems seriously	2.64	(2.56, 2.73)
Patient sociodemographic factors		
Female	0.90	(0.88, 0.92)
Age35-64	1.69	(1.64, 1.74)
Age65&over	2.17	(2.10, 2.25)
Non-white ethnic group	0.62	(0.60, 0.64)
Health status	1.12	(1.12, 1.13)
Innercity area	0.95	(0.93, 0.96)
Deprivation	0.98	(0.98, 0.99)
Interaction terms		
Female*Q20a	0.95	(0.93, 0.97)
Female*Q20b	0.99	(0.97, 1.02)
Female*Q20c	1.00	(0.97, 1.02)
Female*Q20d	1.01	(0.98, 1.03)
Female*Q20e	1.00	(0.98, 1.02)
Female*Q20f	0.99	(0.97, 1.02)
Female*Q20g	1.05	(1.03, 1.08)
age35_64*Q20a	0.98	(0.96, 1.01)
age35_64*Q20b	1.02	(0.98, 1.06)
age35_64*Q20c	0.99	(0.96, 1.03)
age35_64*Q20d	1.04	(1.01, 1.07)
age35_64*Q20e	1.14	(1.10, 1.17)
age35_64*Q20f	1.02	(0.98, 1.05)
age35_64*Q20g	1.12	(1.08, 1.15)
age65_over*20a	1.13	(1.10, 1.17)
age65_over*20b	1.04	(1.00, 1.09)
age65_over*20c	0.95	(0.92, 1.00)
age65_over*20d	1.00	(0.97, 1.04)
age65_over*20e	1.15	(1.11, 1.19)
age65_over*20f	0.98	(0.94, 1.03)
age65_over*20g	1.09	(1.05, 1.14)
Non-white*Q20a	1.17	(1.14, 1.21)
Non-white*Q20b	0.91	(0.88, 0.95)
Non-white*Q20c	0.92	(0.88, 0.95)
Non-white*Q20d	0.89	(0.87, 0.92)
Non-white*Q20e	0.91	(0.88, 0.93)
Non-white*Q20f	1.01	(0.97, 1.05)
Non-white*Q20g	0.85	(0.82, 0.88)

Note: Although some interaction terms are not significant at the 5% level (i.e. the 95% confidence interval contains 1.00) each block of seven interaction terms (addressing two age group effects, gender and ethnicity related interactions) was found to contribute significantly to the model (likelihood ratio tests, $p<0.0001$ for each block).

Calculation of the odds ratios given in Table A2 and in Table 3 of the main paper

Table A1 was used to construct the odds ratios shown in Table A2 below and in Table 3 of the main paper. For example, the odds ratio for the effect of a one point increase in the rating of "Q20c Listening to you" for a non-white male patient in the 35-64 years age group was found by first identifying in Table A1 the values 1.42, 0.99 and 0.92 which are the respective odds ratios associated with that particular aspect of the consultation for male patients in the 35-64 years age group from a non-white ethnic background. The odds ratio is then calculated as $1.42 \times 0.99 \times 0.92 = 1.29$ as shown in the relevant cell of Table A2 below and in Table 3 in the main paper. The calculations were performed using the 'lincom' command in Stata, which also gave 95% confidence intervals for the odds ratios (Table A2).

Table A2: Odds ratio (95% confidence interval) [rank within patient subgroup] for the effect of a one point increase in patient ratings of interpersonal aspects of the consultation on the odds of having definite confidence and trust in the doctor, by patient age, gender and ethnicity.

	White		Non-white	
Age group: 18-34 years	Male	Female	Male	Female
Q20a Giving you enough time	1.17 (1.14, 1.21) [7]	1.11 (1.08, 1.14) [7]	1.38 (1.33, 1.43) [4]	1.31 (1.27, 1.35) [4]
Q20b Asking about your symptoms	1.25 (1.21, 1.30) [6]	1.25 (1.21, 1.29) [6]	1.14 (1.10, 1.19) [7]	1.14 (1.09, 1.18) [7]
Q20c Listening to you	1.42 (1.37, 1.47) [4]	1.41 (1.37, 1.46) [4]	1.30 (1.25, 1.36) [5]	1.30 (1.24, 1.35) [5]
Q20d Explaining tests and treatments	1.55 (1.50, 1.60) [3]	1.56 (1.52, 1.60) [3]	1.38 (1.34, 1.43) [3]	1.39 (1.35, 1.44) [3]
Q20e Involving you in decisions about your care	1.38 (1.34, 1.42) [5]	1.38 (1.34, 1.42) [5]	1.25 (1.21, 1.29) [6]	1.25 (1.21, 1.29) [6]
Q20f Treating you with care and concern	1.59 (1.53, 1.64) [2]	1.58 (1.52, 1.63) [2]	1.60 (1.53, 1.67) [2]	1.59 (1.53, 1.66) [2]
Q20g Taking your problems seriously	2.64 (2.56, 2.73) [1]	2.78 (2.70, 2.87) [1]	2.25 (2.17, 2.33) [1]	2.37 (2.29, 2.45) [1]
Age group: 35-64 years				
Q20a Giving you enough time	1.15 (1.13, 1.18) [7]	1.09 (1.07, 1.12) [7]	1.36 (1.31, 1.40) [5]	1.29 (1.25, 1.33) [5]
Q20b Asking about your symptoms	1.28 (1.25, 1.31) [6]	1.27 (1.24, 1.30) [6]	1.17 (1.12, 1.21) [7]	1.16 (1.12, 1.21) [7]
Q20c Listening to you	1.41 (1.37, 1.44) [5]	1.40 (1.37, 1.44) [5]	1.29 (1.24, 1.34) [6]	1.29 (1.24, 1.33) [6]
Q20d Explaining tests and treatments	1.61 (1.58, 1.65) [2]	1.62 (1.59, 1.65) [2]	1.44 (1.40, 1.49) [3]	1.45 (1.41, 1.50) [3]
Q20e Involving you in decisions about your care	1.56 (1.53, 1.59) [4]	1.56 (1.54, 1.60) [4]	1.42 (1.37, 1.46) [4]	1.42 (1.38, 1.46) [4]
Q20f Treating you with care and concern	1.61 (1.57, 1.65) [3]	1.60 (1.56, 1.64) [3]	1.63 (1.56, 1.69) [2]	1.62 (1.56, 1.68) [2]
Q20g Taking your problems seriously	2.95 (2.88, 3.02) [1]	3.11 (3.04, 3.18) [1]	2.51 (2.43, 2.59) [1]	2.64 (2.55, 2.73) [1]
Age group: 64 years and over				
Q20a Giving you enough time	1.33 (1.30, 1.37) [6]	1.26 (1.23, 1.30) [7]	1.56 (1.51, 1.62) [3]	1.48 (1.43, 1.54) [3]
Q20b Asking about your symptoms	1.31 (1.27, 1.35) [7]	1.30 (1.26, 1.34) [6]	1.19 (1.14, 1.25) [7]	1.19 (1.13, 1.24) [7]
Q20c Listening to you	1.35 (1.31, 1.40) [5]	1.35 (1.31, 1.39) [5]	1.24 (1.19, 1.30) [6]	1.24 (1.18, 1.30) [6]
Q20d Explaining tests and treatments	1.56 (1.51, 1.60) [4]	1.56 (1.52, 1.61) [3]	1.39 (1.34, 1.45) [5]	1.40 (1.35, 1.45) [5]
Q20e Involving you in decisions about your care	1.58 (1.54, 1.62) [2]	1.58 (1.54, 1.63) [2]	1.43 (1.38, 1.49) [4]	1.44 (1.38, 1.49) [4]
Q20f Treating you with care and concern	1.56 (1.51, 1.62) [3]	1.55 (1.50, 1.60) [4]	1.58 (1.50, 1.65) [2]	1.57 (1.49, 1.64) [2]
Q20g Taking your problems seriously	2.89 (2.80, 2.98) [1]	3.04 (2.94, 3.13) [1]	2.45 (2.35, 2.56) [1]	2.58 (2.48, 2.69) [1]

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	5-6
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	6-8
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6-7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-8
Bias	9	Describe any efforts to address potential sources of bias	7-8
Study size	10	Explain how the study size was arrived at	8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6-8
		(*b*) Describe any methods used to examine subgroups and interactions	7-8
		(*c*) Explain how missing data were addressed	6-8
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	6-8
		(*e*) Describe any sensitivity analyses	7-8
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	8
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	8
Outcome data	15*	Report numbers of outcome events or summary measures	9
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	9
		(*b*) Report category boundaries when continuous variables were categorized	9
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	9-10
Discussion			
Key results	18	Summarise key results with reference to study objectives	10-11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11-12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	12-13
Generalisability	21	Discuss the generalisability (external validity) of the study results	12-13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	14

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Factors affecting patients' trust and confidence in GPs - Evidence from the English national GP Patient Survey

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Factors affecting patients' trust and confidence in GPs - Evidence from the English national GP Patient Survey

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Abstract

Objectives

Patients' trust in General Practitioners (GPs) is fundamental to effective clinical encounters. Associations between patients' trust and their perceptions of communication within the consultation have been identified, but the influence of patients' demographic characteristics on these associations is unknown.

We aimed to investigate the relative contribution of patient age, gender and ethnicity in any association between patients' ratings of interpersonal aspects of the consultation and their confidence and trust in the doctor.

Design

Secondary analysis of English national GP patient survey data (2009)

Setting

Primary Care, England, UK.

Participants

Data from year 3 of the GP patient survey: 5,660,217 questionnaires sent to patients aged 18 and over,registered with a GP in England for at least six months; overall response rate 42% after adjustment for sampling design.

Outcome measures

We used binary logistic regression analysis to investigate patients' reported confidence and trust in the GP, analysing ratings of seven interpersonal aspects of the consultation, controlling for patient sociodemographic variables. Further modelling examined moderating effects of age, gender and ethnicity on the relative importance of these seven predictors.

Results

Amongst 1.5 million respondents (adjusted response rate 42%), the sense of 'being taken seriously' had the strongest association with confidence and trust. The relative importance of the seven inter-personal aspects of care was similar for men and women. Non-white patients accorded higher priority to being given enough time than did white patients. Involvement in decisions regarding their care was more strongly associated with reports of confidence and trust for older patients than for younger patients

Conclusion

Associations between patients' ratings of interpersonal aspects of care and their confidence and trust in their GP are influenced by patients' demographic characteristics. Taking account of these findings could inform patient-centred service design and delivery and potentially enhance patients' confidence and trust in their doctor.

Article focus

- There are associations between patients' trust in their GP and a patient-centred approach to consultations.
- This study adds depth by considering the effect of age, gender and ethnicity on the relationship between interpersonal aspects of the consultation and patients' trust.

Key messages

- Interpersonal aspects of the consultation rated in the survey were strongly associated with reported confidence and trust in the doctor, the strongest association being with 'taking your problems seriously'.
- The relative contribution of other aspects of the consultation to reported confidence and trust varied with the age and ethnicity of the patient.
- Our observation that a sense of shared decision making was a stronger determinant of confidence and trust amongst older patients is a new finding.
- Our findings provide the potential opportunity for targeting patient care to the individual in an informed way.

Strengths and weaknesses

- No previous studies have investigated the interaction effects of patient characteristics and interpersonal aspects of the consultation on confidence and trust in such a large sample of patients in the UK.
- Inclusion and exclusion criteria, outcome measures, and the potential for selection bias, were affected by using pre-determined data. However large actual numbers of completed responses, even in under-represented subgroups, were sufficient to make precise estimates of associations.
- We did not have detailed information about the doctors being commented on, patient health status, or continuity of care. However, data relate to one particular doctor-patient interaction, allowing a focused interpretation of aspects of the consultation.

Factors affecting patients' trust and confidence in GPs - analysis of survey data

Background

Trust is central to all human relationships[1] and, in the context of a setting characterised by vulnerability such as in a clinical consultation, may be considered as the belief of the individual placing their trust that the trustee will care for their best interests.[2] As a component of the doctor-patient relationship[3,4] trust stems from patient beliefs that the doctor is their ally and is competent in both clinical and interpersonal skills.[5] Patients' trust in their General Practitioner (GP) underpins the delivery of effective clinical encounters.[2,6,7] It cannot be assumed but needs to be developed.[8] Whilst patients' trust in GPs is high,[6] GPs in England and Wales have adopted a central role in commissioning primary health care, and in this context, the preservation of patients' confidence and trust will play a vital part in supporting future service developments.[2,9]

Numerous benefits may accrue from a trusting, confident doctor-patient relationship. These include the open communication of information between doctor and patient, with subsequent encouragement of patient enablement and improved adherence to medical advice;[6,10,11] the reduction in rates of referral with associated cost reductions;[2]and the improvement of health outcomes and better patient perceptions of health care.[12]

The development of a trusting doctor-patient relationship is facilitated by a range of organisational and personal variables such as patient-centred approaches to care[12,13]and improved communication;[14-17] shared decision making;[18-20] increased consultation length;[21] interpersonal continuity of care [22-24] and providing support without necessary expectation of cure;[25]giving patients a choice of doctor;[26,27]congruence in doctor-patient beliefs,[28,29]and ethnicity,[30] and patient approval of the doctor's appearance.[31]Whilst previous research has investigated associations between age, gender and ethnicity of the patient and their expression of trust in a doctor, the relative

contribution and interaction of these variables with patient perceptions of the consultation remains unknown. To address this shortcoming we investigated the influence of these interactions using data from the English GP Patient Survey (GPPS) undertaken in 2009. [32,33]

We aimed to investigate the relative contribution of patient age, gender and ethnicity in any observed association between patients' ratings of interpersonal aspects of the consultation and their reported confidence and trust in the doctor.

Methods

Data were extracted from year 3 (January to March 2009) of the GP patient survey during which 5,660,217 questionnaires were sent to patients aged 18 years and over who had been continuously registered with a general practice in England for at least six months. The overall response rate was 42% after adjustment for sampling design.[33] The year 3 GPPS data was not weighted, as associations were expected to be less vulnerable to the effect of non-response, unlike prevalence estimates where weighting is essential. A detailed account of the survey methodology is reported elsewhere.[32]

One item (Q20) of the GP patient survey invited patients to rate their most recent consultation with a doctor at the practice in respect of seven interpersonal aspects of care ('Giving you enough time', 'Asking about your symptoms', 'Listening to you', 'Explaining tests and treatments', 'Involving you in decisions about your care', 'Treating you with care and concern' and 'Taking your problems seriously') using a five point scale (5= very good to 1= very poor). The next item (Q21) invited respondents to rate their confidence and trust in the doctor they had seen using a three point scale ('yes definitely', 'yes to some extent', 'no not at all'). Only 3% of individuals expressed no confidence in the doctor they had consulted. For this reason responses to this item were dichotomised into 'definite' versus 'partial or no' confidence and trust, allowing individuals reporting definite confidence and trust to be distinguished from those

reporting less confidence and trust, for the purposes of analysis. Patients were asked to report their gender, age (eight categories: 18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, and 85 years and over), ethnicity (sixteen categories), and their perceived health status (five categories: Poor, Fair, Good, Very good, and Excellent). Patient postcodes were used to attach data on rurality (two categories: Inner city and Elsewhere) and socio-economic deprivation (in quintiles).[34] Our main analyses used only respondents who provided informative responses; with ratings, as opposed to responding with 'doesn't apply', to all parts of Q20 and Q21; and with complete data on the six demographic variables. Therefore we compared these respondents with those with incomplete data in respect of gender, age, ethnicity and definite confidence and trust in the doctor.

Binary logistic regression was used throughout to model the average effect of a one point increase in the patient's rating of the interpersonal aspects of care on the odds of reporting definite confidence and trust in the doctor. Initially, a 'main effects' model was used to determine the effects (odds ratios) associated with patient age, gender, ethnicity and the seven ratings of interpersonal aspects of the consultation. The null hypothesis, that the odds ratios were equal for the seven 'interpersonal' ratings was tested using a likelihood ratio test and the odds ratios were then ranked in order of size.

We noted that the rank order of the contribution of the seven 'interpersonal' ratings followed almost exactly the order that the items appear in the survey questionnaire. Since these items (question 19a-g) immediately precede the question addressing confidence and trust (question 20), we explored the possibility of a question ordering effect by regressing a later item reflecting 'overall satisfaction with care' (question 25), on the 'interpersonal' items, along with the sociodemographic variables.

A second 'interaction model' was used to establish the moderating effects of age, gender and ethnicity on the effects of the seven 'interpersonal' ratings. To facilitate easy comparisons, the odds ratios for the effect of a one point increase in each rating of the consultation on having definite confidence and trust in the doctor, were estimated and ranked in order of size for various age, gender and ethnic subgroups by combining the appropriate main and interaction terms. To simplify interpretation of the results, patient

age was categorised into three groups (18-35, 35-64, 65 years and over) and ethnicity was dichotomised (white, non-white) to create 12 (=2×3×2) gender by age by ethnicity subgroups. The original categorisation of the data would have created 256 such subgroups and made interpretation too complex.

Both regression models controlled for patients' perceived health status, their rurality, and socio-economic deprivation and incorporated a random effect to account for clustering of the data by practice. We were unable to account for clustering by doctor as the GP patient survey does not ask patients to identify the individual doctor being rated. All analyses were performed in STATA version SE10.1 for Windows.

Results

Of 2,163,456 patients in the sample, 296,066 (14%) had indicated that one or more of the aspects of the consultation were not relevant to the last time they had seen the doctor. Although these data were treated as missing in our analysis they should be considered 'missing by design'. A further 391,138 (18%) of patients had truly missing data, leaving an effective sample size for analysis of 1,476,252 (26% of the 5,660,217 patients who were originally sent questionnaires). Individuals with complete data differed from those with incomplete data: more of them were male (44% vs. 38%), more were in the middle age groups (56% vs. 49% aged 35-64 years), slightly more were white (87% vs. 86%) and more reported definite confidence and trust in the doctor (73% vs. 69%). Although statistically significant due to the large sample size ($p<0.001$ in all cases), these differences are fairly small.

Whilst similar proportions of men and women reported definite confidence and trust in the doctor (74% vs. 73% respectively), definite confidence and trust was more commonly reported by older patients than by younger patients (Table 1); by patients from white ethnic backgrounds than by non-white patients (75% vs. 61% respectively); by patients living outside inner-city areas compared with those from inner-city areas (79% vs. 72%);

by those reporting excellent health compared with those reporting poor health (82% vs. 71%); and among those in areas of low deprivation compared with those in areas of high deprivation (77% vs. 69%). Ratings of the seven interpersonal aspects of care were strongly skewed towards favourable responses: 82-90% of responses were 'Good' or 'Very good'.

The main effects binary logistic regression model, predicting the odds that a patient reported definite confidence and trust in the doctor, is shown in Table 2. Although increases in all seven inter-personal aspects of care predicted increased confidence and trust, the odds ratios associated with these seven aspects differed significantly (likelihood ratio test, $p<0.0001$). The sense of problems having been taken seriously was the strongest predictor, increasing the odds of expressing confidence and trust almost threefold. More modest effects were evident in respect of treating the patient with care and concern, of explaining tests and treatments, and of involving the patient in decisions regarding their care. The sense of having been given enough time increased the same odds by only around 20%.

In investigating item ordering effects, the order of influence of the aspects of the consultation on the proximate confidence and trust item, was observed to be similar to the order of influence of the aspects of care on the more distant satisfaction item, with the exception that 'giving you enough time' was ranked second (results not shown). The proximity of questions in presentation therefore did not appear to be a major determinant of their rank order of predictive influence.

Table 3 shows the odds ratios, derived from the logistic regression 'interaction' model, for the effect of a one point increase in each rating of the consultation on reporting definite confidence and trust in the doctor. The complete regression model, along with confidence intervals and the method of deriving the odds ratios shown in Table 3, is included as a web appendix. The rank order of the estimated odds ratios highlights the relative influence of the seven aspects of the consultation on reporting definite confidence

and trust. The dominance of having problems taken seriously is evident throughout the rankings. The rank orders of the contribution of the seven inter-personal aspects of care were similar for men and women. However, non-white patients, particularly those in the oldest age group, accorded higher priority to being given enough time during the consultation than did white patients. A notable difference was observed for patients aged 35 or less, who accorded lower ranking to being involved in decisions regarding their care than did older patients.

Discussion

Summary of main findings

A substantial majority of GP patient survey respondents expressed definite confidence and trust in their GP. Patients' confidence and trust in the doctor increased with patient age, was similar for males and females, and was reported more frequently by those of white ethnicity. For all items relating to interpersonal aspects of the consultation, higher patient ratings were associated with an increased likelihood of reporting confidence and trust. Confidence and trust was most strongly associated with patients' perceptions of having their problems taken seriously.

There was no appreciable difference between men and women in respect of the relative importance of aspects of the consultation as potential predictors of confidence and trust in their doctor. However, we observed some differences between patients in different age and ethnic groups: As age increases, patients who report greater trust appear to particularly value being involved in decisions about their care; non-white patients, particularly those aged 65 or more, placed particular value on being given enough time during their consultations. The identification of some immutable patient characteristics associated with systematic variation in patient's confidence and trust provides the

potential opportunity for targeting patient care in an informed way – for example by actively engaging older patients in decisions about their care.

Strengths and limitations of the study

We conducted a secondary analysis of data from a major national survey involving a large sample of patients. The inclusion and exclusion criteria and outcome measures were limited by using pre-determined data, however the data set was large and varied enough to answer the questions posed. No previous studies have investigated the interaction effects of patient characteristics and interpersonal aspects of the consultation on confidence and trust in such a large sample of patients in the UK.

The adjusted survey response rate was 42%, with younger patients, non-white patients, and those living in areas of socioeconomic deprivation being under-represented amongst respondents.[34] This under-representation was comparable to similar surveys conducted elsewhere in the world.[35-37] A study of key measures within the GP patient survey found no evidence of non-response bias.[32] Individuals with complete data differed from those with incomplete data. However, although statistically significant, these differences were small. We therefore recognise the potential for selection bias in our data, although believe that our results might reasonably reflect the wider UK population. The large actual numbers of completed responses, even in under-represented subgroups, were sufficient to make precise estimates of associations.

We noted that the order in which the aspects of the consultation were presented in the patient questionnaire matched the general rank order of the estimated odds ratios for the relative contribution of aspects of the consultation to reporting definite confidence and trust. Whilst the variation in this rank ordering amongst different patient subgroups, together with our results regarding the 'overall satisfaction' item suggest otherwise, it remains possible that question-ordering effects are important. Such effects could be tested in future by altering the item order.

We did not have access to detailed information about the doctors or practices being commented on, and are therefore unable to assess the contribution of these variables in determining confidence and trust. Similarly, although previous research has suggested that the objective health status of patients may be of importance,[6,38] detailed information was not available to us within this dataset. It was not possible to tell if patients were referring to their usual doctor when responding to questions regarding the 'last time you saw a doctor'. Conclusions therefore, could not be drawn about continuity of care. However, data relate to one particular doctor-patient interaction, allowing a focused interpretation of aspects of the consultation within that particular consultation.

The relationship between the concepts of confidence and trust has previously been explored, with a distinction between the two concepts being suggested, based on an individual's perception of the situation.[39] Luhmann's work proposes that where confidence exists within a relationship, alternatives may not be considered, outcomes judged 'inevitable', and, if confidence is disappointed, blame attributed externally. In contrast, Luhmann suggests that where trust characterises a relationship, choice may be inherent, variable outcomes accepted, and disappointment characterised by internal rather than external attribution of blame. In the context of healthcare, Luhmann suggests that familiarity (for example between doctor and patient) may be an important determinant of whether the relationship is characterised by trust or confidence. Developing these ideas, some researchers have suggested that patients' trust in health care practitioners may relate to interpersonal familiarity, and that patients' trust in healthcare systems is often greatest where systems are long established and known to the individual patient.[40] In situations characterised by lack of familiarity, patients may simply have to exercise faith in an individual practitioner or in the healthcare system.[39]

The two concepts were, however, conflated in the wording of the General Practice Patient Survey: "Did you have confidence and trust in the doctor you saw?" We were therefore unable to distinguish between confidence and trust in our investigation. Complex systems, such as the primary health care system in the UK, have been considered by some

to require the exercise of confidence and trust as a pre-requisite for effective engagement with, and use of, the system.[41,42]

Comparison with existing literature

The association of patients' trust with increasing age and with white ethnicity, has been previously reported.[6] Our findings add depth to the current literature by considering the moderating effect of age, gender and ethnicity on the relationship between interpersonal aspects of care reflected in a recent consultation, and patients' confidence and trust in the doctor.

Previous research has highlighted associations between patients' trust and several interpersonal aspects of the doctor-patient relationship within the consultation. This includes the importance to patients of effective communication,[18] a sense of partnership between doctor and patient,[43] and the patient's perception of being given enough time during the consultation.[44] However, our observation that a sense of shared decision making was a stronger determinant of reported confidence and trust amongst older patients is a new finding. This contrasts with previous literature which has suggested that older patients may prefer a focus on receiving information rather than on active participation.[45,46] One explanation might be that this reflects a changing culture in which older people have a greater awareness of available healthcare, through media coverage for example. They may therefore feel more willing to be involved in decisions about which they have a prior awareness. It may also reflect a more holistic approach by doctors to support patients' involvement. The contributions of trust and of shared decision making in patients' evaluations of health services have previously been considered separately.[47] Our findings, although based on cross sectional data with acknowledged potential for bias, suggest these variables are related and their effect on patients' perceptions and evaluations of health services are likely to be confounded.

Implications for future research and clinical practice

A number of the determinants of confidence and trust in doctors reported in our study would benefit from further investigation using qualitative approaches, including further exploration of patient perceptions of their problems being taken seriously. Such approaches might be beneficial in informing patient centred primary health care delivery and planning.[48] Providing services that are responsive to the needs and aspirations of an ageing population,[49] in respect of confidence and trust, might involve doctors routinely engaging in shared decision making with older patients during consultations. Highlighting of these issues in relevant undergraduate and postgraduate educational and training fora might be appropriate.

We have shown that the interpersonal aspects of the consultation rated in the survey were strongly associated with reported confidence and trust in the doctor, the strongest association being with 'taking your problems seriously'. The relative contribution of other aspects of the consultation to reported confidence and trust varied with the age and ethnicity of the patient. Incorporating these findings in delivering routine care has the potential to support a patient-centred approach to care, tailored to the patient as an individual.

Ethics

The Central Office for Research Ethics Committee (COREC) advised that the survey does not require formal medical research ethical approval but it adheres to the Market Research Society code of ethics

Conflicts of interest

Nil

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Contributors

JEC was responsible for planning the study, drafting and finalising the manuscript. DRS critically revised the manuscript. MJR, GA and JEC interpreted the data and participated in critical review. MR also provided critical review. JLC was responsible for supervision, aided in interpretation of data and also critically revised the manuscript.

Data sharing

No additional data available.

References

1. Mascarenhas, O., et al., *Hypothesized predictors of patient-physician trust and distrust in the elderly: implications for health and disease management.* Clinical Interventions in Ageing, 2006. **1**(2): p. 175-188.
2. Hall, M., et al., *Trust in Physicians and Medical Institutions: What Is It, Can It Be Measured, and Does It Matter?* The Milbank Quarterly, 2001. **79**(4): p. 613-639.
3. Peabody, F., *The Care of the Patient.* Journal of the American Medical Association, 1927. **88**: p. 877-882.
4. Ridd, M., et al., *The patient-doctor relationship: a synthesis of the qualitative literature on patients' perspectives.* British Journal of General Practice, 2009. **59**: p. 268-275.
5. Mechanic, D. and Meyer, S.*Concepts of trust among patients with serious illness.* Social Science & Medicine, 2000. **51**(5): p. 657-668.
6. Tarrant, C.S., Stokes, T. Baker, R., *Factors associated with patients' trust in their general practitioner: a cross-sectional survey.* British Journal of General Practice, 2003. **53**: p. 798-800.
7. Fugelli, P., *Trust - in general practice.* British Journal of General Practice, 2001. **51**: p. 575-579.
8. Meyer, SB., Ward, PR., Jiwa, M.. *Does prognosis and socioeconomic status impact on trust in physicians? Interviews with patients with coronary disease in South Australia.* BMJ Open, 2012; **2**: e001389. doi:10.1136/bmjopen-2012-001389
9. Platonova, E.A., *Understanding Patient Satisfaction, Trust, and Loyalty to Primary Care Physicians.* Medical Care Research and Review, 2008. **65**(6): p. 696-712.
10. Little, P., et al., *Observational study of effect of patient centredness and positive approach on outcomes of general practice consultations.* British Medical Journal, 2001. **323**: p. 908-911.
11. Thom, DH., et al., *Further validation and reliability testing of the trust in physicians scale*. Medical Care, 1999. **37**: p. 510-7.

12. Safran, DG., et al., *Linking Primary Care Performance to Outcomes of Care*. Journal of Family Practice, 1998. **47**(3): p. 213–20.
13. Fiscella, K., et al., *Patient trust: is it related to patient-centred behaviour of primary care physicians?* Medical Care, 2004. **42**(11): p. 1049-1055.
14. Thom, D., *Physician behaviors that predict patient trust.* Journal of Family Practice, 2001. **50**(4): p. 323-328.
15. Ogden, J., et al., *What's in a name? An experimental study of patients' views of the impact and function of a diagnosis.* Family Practice, 2003. **20**(3): p. 248-253.
16. Burkitt Wright, E., Holcombe, C., and Salmon, P.,*Doctors' communication of trust, care, and respect in breast cancer: qualitative study.* British Medical Journal, 2004. **328**. 864. doi: http://dx.doi.org/10.1136/bmj.38046.771308.7C
17. Edwards, A., et al., *Patient-based outcome results from a cluster randomized trial of shared decision making skill development and use of risk communication aids in general practice.* Family Practice, 2004. **21**(4): p. 347-354.
18. Ommen, O.T.,Holger, S.P.,Janssen, C., *The relationship between social support, shared decision-making and patient's trust in doctors: a cross-sectional survey of 2,197 inpatients using the Cologne Patient Questionnaire.* Int J Public Health, 2010. **56**(319-327).
19. Cohen, D., et al., *Resource effects of training general practitioners in risk communication skills and shared decision making competences.* Journal of Evaluation in Clinical Practice, 2004. **10**(3): p. 439-445.
20. Edwards, A. and Elwyn, G.,*Involving patients in decision making and communicating risk: A longitudinal evaluation of doctors' attitudes, and confidence during a randomized trial.* Journal of Evaluation in Clinical Practice, 2004. **10**(3): p. 431-437.
21. Freeman, G., et al., *Evolving general practice consultation in Britain: issues of length and context.* British Medical Journal, 2002. **324**: p. 880-882.
22. Mainous, A., et al., *Continuity of Care and Trust in One's Physician: Evidence From Primary Care in the United States and the United Kingdom.* Family Medicine, 2001. **33**(1): p. 22-27.

23. Pereira Gray, D., et al., *Towards a theory of continuity of care.* Journal of the Royal Society of Medicine, 2003. **96**: p. 160-166.
24. Tarrant, C., *Continuity and Trust in Primary Care: A Qualitative Study Informed by Game Theory.* Annals of Family Medicine, 2010. **8**(5): p. 440-446.
25. Cocksedge, S.G., Nugent, R., Kelly, G., et al.*Holding relationships in primary care: a qualitative study of doctors' and patients' perceptions.* British Journal of General Practice, 2011. **61**(568):e484-91. doi 10.3399/bjgp11X588457.
26. Kao, A., et al., *Patients' Trust in Their Physicians. Effects of Choice, Continuity, and Payment Method.* Journal of General Internal Medicine, 1999. **13**: p. 681-686.
27. Chu-Weininger, M., and Balkrishnan, R.,*Consumer satisfaction with primary care provider choice and associated trust.* BioMed Central Health Services Research, 2006. **6**: p. 139-152.
28. Staiger, T., et al., *Brief Report: Patient-Physician Agreement as a Predictor of Outcomes in Patients with Back Pain.* Journal of General Internal Medicine, 2005. **20**: p. 935-937.
29. Krupat, E., et al., *When Physicians and Patients Think Alike: Patient-Centred Beliefs and Their Impact on Satisfaction and Trust.* Family Practice, 2001. **50**(12): p. 1057-1062.
30. Tarn, D., et al., *Trust in One's Physician: The Role of Ethnic Match, Autonomy, Acculturation, and Religiosity Among Japanese and Japanese Americans.* Annals of Family Medicine, 2005. **3**(4): p. 339-347.
31. McKinstry, B. and Wang, J.X.,*Putting on the style: what patients think of the way their doctor dresses.* British Journal of General Practice, 1991. **41**: p. 275-278.
32. Campbell, J., et al., *Development of the national GP Patient Survey for use in primary care in the National HealthService in the UK.* BMC Family Practice, 2009. **10**(57).doi:10.1186/1471-2296-10-57
33. Roland, M., et al., *Reliability of patient responses in pay for performance schemes: analysis of national General Practitioner Patient Survey data in England.* British Medical Journal, 2009. **339**(7727): p. 955.

34. Department of communities and local government. *The English indices of deprivation* [internet] 2007. (Updated; cited 16 July 2012). Available from: http://www.communities.gov.uk/documents/communities/pdf/576659.pdf

35. Elliott MN, Edwards C, Angeles J, et al. *Patterns of unit and item nonresponse in the CAHPS hospital survey.* Health Serv Res 2005;**40**:2096-119

36. Kahn KL, Honhiu L, Adams JL, et al. *Methodological challenges associated with patient responses to follow-up longitudinal surveys regarding quality of care*. Health Serv Res 2003;**38**:1579-98

37. Angus VC, Entwistle VA, Emslie MJ, et al. *The requirement for prior consent to participate on survey response rates: a population-based survey in Grampian*. BMC Health Serv Res 2003;**3**:21

38. Thorne, SE., Robinson, CA., *Guarded alliance: health care relationships in chronic disease.* Image J Nurse Sch, 1989. 21(3): p. 153-7.

39. Luhmann, N., *Familiarity, confidence, trust: Problems and alternatives*, in Gambetta, Diego (ed.) Trust: Making and breaking cooperative relations,electronic edition, Department of Sociology, University of Oxford, 2000; chapter 6, 94-107. [Accessed 26th March 2013]. http://www.sociology.ox.ac.uk/papers/luhmann94-107.pdf

40. Gidman, W., Ward., P., McGregor, L., *Understanding public trust in services provided by community pharmacists relative to those provided by general practitioners: a qualitative study.* BMJ Open, 2012; **2**: e000939. doi:10.1136/bmjopen-2012-000939

41. Jalava, J., *From Norms to Trust. The Luhmannian connections between trust and system*, European Journal or Social Theory, 2003; **6**(2): p.173-190

42. Dibben, MR., Davies, HTO., *Trustworthy doctors in confidence building systems.* Qual Saf Health Care, 2004: **13**(2). p. 88-89.

43. Little, P., et al., *Preferences of patients for patient centred approach to consultation in primary care: observational study.* British Medical Journal, 2001. **322**: p. 1-7.

44. Skirbekk, H.M., Hjortdahl, AL., Per., Arnstein, F.,*Mandates of Trust in the Doctor-Patient Relationship.* Qualitative Health Research, 2011. **21**(9): p. 1182-1190.

45. Bastiaens, H.V.R., Pavlic, P., Raposo, DR., et al. *Older people's preferences for involvement in their own care: a qualitative study in primary health care in 11 European countries.* Patient Educ Couns, 2007. **68**(1): p. 33-42.

46. Levinson, W.K., Kuby, A., Thisted, RA., *Not all patients want to participate in decision making. A national study of public preferences.* J Gen Intern Med, 2005. **20**(6): p. 531-5.

47. Joffe, S., et al., *What do patients value in their hospital care? An empirical perspective on autonomy centred bioethics.* Journal of Medical Ethics, 2003. **29**: p. 103-108.

48. Calnan, M.w., Sanford, E., *Public trust in health care: the system or the doctor?* Qual Saf Health Care, 2004. **13**: p. 92-97.

49. UK National Statistics. *Topic guide to: Older People* [internet] 2012. (Updated 1 Sep 2012; cited 9 Jan 2012). Available from: http://www.statistics.gov.uk/hub/population/ageing/older-people

Table1.Sociodemographic profile of analysis sample and percentage of each subgroup reporting no confidence, partial confidence or definite confidence and trust in the doctor.

Subgroup	N	% of sample	Did you have confidence and trust in the doctor you saw? No not at all (% of subgroup)	Yes to some extent (% of subgroup)	Yes definitely (% of subgroup)
Gender					
Male	651,163	44	3	23	74
Female	825,089	56	4	24	73
Age (years)					
18-24	70,435	5	7	34	60
25-34	157,753	11	7	33	60
35-44	234,768	16	5	27	68
45-54	274,851	19	4	25	71
55-64	314,986	21	3	22	76
65-74	246,692	17	1	17	81
75-84	140,851	10	1	16	83
85and over	35,916	2	1	16	82
Ethnic group					
White	1,279,862	87	3	22	75
Mixed	10,069	1	6	31	63
Asian / Asian British	79,512	5	6	35	59
Black / Black British	38,131	3	4	30	65
Chinese	6,657	<1	6	43	51
Other	62,021	4	7	32	62
Perceived health status					
Poor	86,597	6	6	23	71
Fair	293,071	20	4	26	70
Good	537,337	36	3	26	71
Very good	429,332	29	3	22	76
Excellent	129.925	9	3	16	82
Locality					
Non-inner city	281,949	19	2	19	79
Inner city	1,194,303	81	4	25	72
Deprivation					
Lowest	267,414	18	2	21	77
Next lowest	291,191	20	3	21	76
Middle	296,938	20	3	23	74
Next highest	298,096	20	4	25	71
Highest	322,613	22	5	26	69
All	1,476,252	100	3	24	73

Table 2. Odds ratios (95% confidence interval) for the 'main effects' binary logistic regression model predicting definite confidence and trust in the doctor.

	Odds Ratio	(95% CI)
Ratings of last consultation		
Q20a Giving you enough time	1.19	(1.18, 1.21)
Q20b Asking about your symptoms	1.26	(1.24, 1.28)
Q20c Listening to you	1.38	(1.36, 1.40)
Q20d Explaining tests and treatments	1.56	(1.55, 1.58)
Q20e Involving you in decisions about your care	1.51	(1.49, 1.52)
Q20f Treating you with care and concern	1.60	(1.57, 1.62)
Q20g Taking your problems seriously	2.86	(2.82, 2.89)
Patient sociodemographic variables		
Female (ref Male)	0.90	(0.89, 0.91)
Age35-64 years (ref age <35 years)	1.27	(1.25, 1.29)
Age65 years &over (ref age <35 years)	1.60	(1.58, 1.63)
Non-white ethnic group (ref White)	0.89	(0.88, 0.91)
Perceived health status	1.12	(1.12, 1.13)
Inner city setting (ref non-inner city setting)	0.95	(0.93, 0.96)
Deprivation	0.98	(0.98, 0.99)

Table 3. Odds ratios for the effect of a one point increase in patient ratings of interpersonal aspects of the consultation on the odds of having definite confidence and trust in the doctor, by patient age, gender and ethnicity. The odds ratios within each patient subgroup are ranked in the lower half of the table.

			age<35				age35-64				age65+			
			White		Non-White		White		Non-White		White		Non-White	
	Consultation aspects	All patients*	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Odds Ratios	Giving you enough time	1.19	1.17	1.11	1.38	1.31	1.15	1.09	1.36	1.29	1.33	1.26	1.56	1.48
	Asking about your symptoms	1.26	1.25	1.25	1.14	1.14	1.28	1.27	1.17	1.16	1.31	1.30	1.19	1.19
	Listening to you	1.38	1.42	1.41	1.30	1.30	1.41	1.40	1.29	1.29	1.35	1.35	1.24	1.24
	Explaining tests and treatments	1.56	1.55	1.56	1.38	1.39	1.61	1.62	1.44	1.45	1.56	1.56	1.39	1.40
	Involving you in decisions about your care	1.51	1.38	1.38	1.25	1.25	1.56	1.56	1.42	1.42	1.58	1.58	1.43	1.44
	Treating you with care and concern	1.60	1.59	1.58	1.60	1.59	1.61	1.60	1.63	1.62	1.56	1.55	1.58	1.57
	Taking your problems seriously	2.86	2.64	2.78	2.25	2.37	2.95	3.11	2.51	2.64	2.89	3.04	2.45	2.58
Rank of Importance **	Giving you enough time	7	7	7	4	4	7	7	5	5	6	7	3	3
	Asking about your symptoms	6	6	6	7	7	6	6	7	7	7	6	7	7
	Listening to you	5	4	4	5	5	5	5	6	6	5	5	6	6
	Explaining tests and treatments	3	3	3	3	3	2	2	3	3	4	3	5	5
	Involving you in decisions about your care	4	5	5	6	6	4	4	4	4	2	2	4	4
	Treating you with care and concern	2	2	2	2	2	3	3	2	2	3	4	2	2
	Taking your problems seriously	1	1	1	1	1	1	1	1	1	1	1	1	1

* Odds ratios taken from table 2

** 1 = most influential, 7 = least influential

Factors affecting patients' trust and confidence in GPs - Evidence from the English national GP Patient Survey

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Factors affecting patients' confidence and trust in GPs – Evidence from the English national GP Patient Survey

Abstract

Objectives

Patients' trust in General Practitioners (GPs) is fundamental to ~~delivering~~ effective clinical encounters. Associations between patients' trust and their perceptions of communication within the consultation have been identified, but the influence of patients' demographic characteristics on these associations is unknown.

We aimed to investigate the relative contribution of patient age, gender and ethnicity in any association between patients' ratings of interpersonal aspects of the consultation and their confidence and trust in the doctor.

Design

Secondary analysis of English national GP patient survey data (2009)

Setting

Primary Care, England, UK.

Participants

Data from year 3 of the GP patient survey: 5,660,217 questionnaires sent to patients aged 18 and over, ~~who had been~~ registered with a ~~general practice~~GP in England for at least six months; overall response rate 42% after adjustment for sampling design.

Outcome measures

We used binary logistic regression analysis to investigate patients' reported confidence and trust in the GP, analysing ratings of seven interpersonal aspects of the consultation, controlling for patient sociodemographic variables. Further modelling examined ~~the~~

moderating effects of age, gender and ethnicity on the relative importance of these seven predictors.

Results

Amongst 1.5 million respondents (adjusted response rate 42%), the sense of 'being taken seriously' had the strongest association with confidence and trust. The relative importance of the seven inter-personal aspects of care was similar for men and women. Non-white patients accorded higher priority to being given enough time than did white patients. Involvement ~~of older patients~~ in decisions regarding their care was more strongly associated with reports of confidence and trust for older patients than for younger patients~~had a greater effect than amongst younger patients.~~

Conclusion

Associations between patients' ratings of interpersonal aspects of care and their confidence and trust in their GP are influenced by patients' demographic characteristics. Taking account of these findings could inform patient-centred service design and delivery and potentially enhance patients' confidence and trust in their doctor.

Article focus

- There are associations between patients' trust in their GP and a patient-centred approach to consultations.
- This study adds depth by considering the effect of age, gender and ethnicity on the relationship between interpersonal aspects of the consultation and patients' trust.

Key messages

- Interpersonal aspects of the consultation rated in the survey were strongly associated with reported confidence and trust in the doctor, the strongest association being with 'taking your problems seriously'.
- The relative contribution of other aspects of the consultation to reported confidence and trust varied with the age and ethnicity of the patient.
- Our observation that a sense of shared decision making was a stronger determinant of confidence and trust amongst older patients is a new finding.
- Our findings provide the potential opportunity for targeting patient care to the individual in an informed way.

Strengths and weaknesses

- No previous studies have investigated the interaction effects of patient characteristics and interpersonal aspects of the consultation on confidence and trust in such a large sample of patients in the UK.
- Inclusion and exclusion criteria, outcome measures, and the potential for selection bias, were affected by using pre-determined data. However large actual numbers of completed responses, even in under-represented subgroups, were sufficient to make precise estimates of associations.
- We did not have detailed information about the doctors being commented on, patient health status, or continuity of care. However, data relate to one particular doctor-patient interaction, allowing a focused interpretation of aspects of the consultation.

Factors affecting patients' trust and confidence in GPs - analysis of survey data

Background

Trust is central to all human relationships[1] and, in the context of a setting characterised by vulnerability such as in a clinical consultation, may be considered as the belief of the individual placing their trust that the trustee will care for their best interests.[2] As a component of the doctor-patient relationship[3,4] trust stems from patient beliefs that the doctor is their ally and is competent in both clinical and interpersonal skills.[5] Patients' trust in their General Practitioner (GP) underpins the delivery of effective clinical encounters.[2,6,7] It cannot be assumed but needs to be developed.[8] Whilst patient~~'~~s' trust ~~and confidence~~ in GPs is high,[6] GPs in England and Wales have adopted a central role in commissioning primary health care, and in this context, the preservation of patients' confidence and trust will play a vital part in supporting future service developments.[2,9]

Numerous benefits may accrue from a trusting, confident doctor-patient relationship. These include the open communication of information between doctor and patient, with subsequent encouragement of patient enablement and improved adherence to medical advice;[6,10,11] the reduction in rates of referral with associated cost reductions;[2]and the improvement of health outcomes and better patient perceptions of health care.[12]

The development of a trusting doctor-patient relationship is facilitated by a range of organisational and personal ~~factors~~ variables such as patient-centred approaches to care[12,13]and improved communication;[14-17] shared decision making;[18-20] increased consultation length;[21] interpersonal continuity of care [22-24] and providing support without necessary expectation of cure;[25]giving patients a choice of doctor;[26,27]congruence in doctor-patient beliefs,[28,29]and ethnicity,[30] and patient approval of the doctor's appearance.[31]

Whilst previous research has investigated associations between age, gender and ethnicity of the patient and their expression of ~~confidence and~~ trust in a doctor, the relative contribution and interaction of these ~~factors~~ variables with patient perceptions of the consultation remains unknown. To address this shortcoming we investigated the influence of these interactions using data from the English GP Patient Survey (GPPS) undertaken in 2009. [32,33]

We aimed to investigate the relative contribution of patient age, gender and ethnicity in any observed association between patients' ratings of interpersonal aspects of the consultation and their reported confidence and trust in the doctor.

Methods

Data were extracted from year 3 (January to March 2009) of the GP patient survey during which 5,660,217 questionnaires were sent to patients aged 18 years and over who had been continuously registered with a general practice in England for at least six months. The overall response rate was 42% after adjustment for sampling design.[33] The year 3 GPPS data was not weighted, as associations were expected to be less vulnerable to the effect of non-response, unlike prevalence estimates where weighting is essential. A detailed account of the survey methodology is reported elsewhere.[32]

One item (Q20) of the GP patient survey invited patients to rate their most recent consultation with a doctor at the practice in respect of seven interpersonal aspects of care ('Giving you enough time', 'Asking about your symptoms', 'Listening to you', 'Explaining tests and treatments', 'Involving you in decisions about your care', 'Treating you with care and concern' and 'Taking your problems seriously') using a five point scale (5= very good to 1= very poor). The next item (Q21) invited respondents to rate their confidence and trust in the doctor they had seen using a three point scale ('yes definitely', 'yes to some extent', 'no not at all'). Only 3% of individuals expressed no confidence in the doctor they had consulted. For this reason responses to this item were

dichotomised into 'definite' versus 'partial or no' confidence and trust, allowing individuals reporting definite confidence and trust to be distinguished from those reporting less confidence and trust, for the purposes of analysis. Patients were asked to report their gender, age (eight categories: 18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, and 85 years and over), ethnicity (sixteen categories), and their perceived health status (five categories: Poor, Fair, Good, Very good, and Excellent). Patient postcodes were used to attach data on rurality (two categories: Inner city and Elsewhere) and socio-economic deprivation (in quintiles).[34] Our main analyses used only respondents who provided informative responses; with ratings, as opposed to responding with 'doesn't apply', to all parts of Q20 and ~~,~~ Q21; and with complete data on the six demographic variables. Therefore we compared these respondents with those with incomplete data in respect of gender, age, ethnicity and definite confidence and trust in the doctor.

Binary logistic regression was used throughout to model the average effect of a one point increase in the patient's rating of the interpersonal aspects of care on the odds of reporting definite confidence and trust in the doctor. Initially, a 'main effects' model was used to determine the effects (odds ratios) associated with patient age, gender, ethnicity and the seven ratings of interpersonal aspects of the consultation. The null hypothesis, that the odds ratios were equal for the seven 'interpersonal' ratings was tested using a likelihood ratio test and the odds ratios were then ranked in order of size. ~~In estimating the 'average effect of a one point increase' in any of the 'interpersonal' ratings on the odds of reporting definite confidence and trust we were assuming each of the ratings to be approximately linearly related to the log odds. We verified the reasonableness of this assumption using simple linear regressions of the observed log odds on each of the ratings (results not shown).~~

We noted that the rank order of the contribution of the seven 'interpersonal' ratings followed almost exactly the order that the items appear in the survey questionnaire. Since these items (question 19a-g) immediately precede the question addressing confidence and trust (question 20), we explored the possibility of a question ordering effect by regressing

a later item reflecting 'overall satisfaction with care ~~at the surgery~~' (question 25), on the 'interpersonal' items, along with the sociodemographic variables.

A second 'interaction model' was used to establish the moderating effects of age, gender and ethnicity on the effects of the seven 'interpersonal' ratings. To facilitate easy comparisons, the odds ratios for the effect of a one point increase in each rating of the consultation on having definite confidence and trust in the doctor, were estimated and ranked in order of size for various age, gender and ethnic subgroups by combining the appropriate main and interaction terms. To simplify interpretation of the results, patient age was categorised into three groups (18-35, 35-64, 65 years and over) and ethnicity was dichotomised (white, non-white) to create 12 (=2×3×2) gender by age by ethnicity subgroups. The original categorisation of the data would have created 256 such subgroups and made interpretation too complex.

Both regression models controlled for patients' perceived health status, their rurality, and socio-economic deprivation and incorporated a random effect to account for clustering of the data by practice. We were unable to account for clustering by doctor as the GP patient survey does not ask patients to identify the individual doctor being rated. All analyses were performed in STATA version SE10.1 for Windows.

Results

Of 2,163,456 patients in the sample, 296,066 (14%) had indicated that one or more of the aspects of the consultation were not relevant to the last time they had seen the doctor. Although these data were treated as missing in our analysis they should be considered 'missing by design'. A further 391,138 (18%) of patients had truly missing data, leaving an effective sample size for analysis of 1,476,252 (26% of the 5,660,217 patients who were originally sent questionnaires). Individuals with complete data differed from those with incomplete data: more of them were male (44% vs. 38%), more were in the middle age groups (56% vs. 49% aged 35-64 years), slightly more were white (87% vs. 86%)

and more reported definite confidence and trust in the doctor (73% vs. 69%). Although statistically significant due to the large sample size ($p<0.001$ in all cases), these differences are fairly small.

Whilst similar proportions of men and women reported definite confidence and trust in the doctor (74% vs. 73% respectively), definite confidence and trust was more commonly reported by older patients than by younger patients (Table 1); by patients from white ethnic backgrounds than by non-white patients (75% vs. 61% respectively); by patients living outside inner-city areas compared with those from inner-city areas (79% vs. 72%); by those reporting excellent health compared with those reporting poor health (82% vs. 71%); and among those in areas of low deprivation compared with those in areas of high deprivation (77% vs. 69%). Ratings of the seven interpersonal aspects of care were strongly skewed towards favourable responses: 82-90% of responses were 'Good' or 'Very good'.

The main effects binary logistic regression model, predicting the odds that a patient reported definite confidence and trust in the doctor, is shown in Table 2. Although increases in all seven inter-personal aspects of care predicted increased confidence and trust, the odds ratios associated with these seven aspects differed significantly (likelihood ratio test, $p<0.0001$). The sense of problems having been taken seriously was the strongest predictor, increasing the odds of expressing confidence and trust almost threefold. More modest effects were evident in respect of treating the patient with care and concern, of explaining tests and treatments, and of involving the patient in decisions regarding their care. The sense of having been given enough time increased the same odds by only around 20%.

In investigating item ordering effects, the order of influence of the aspects of the consultation on the proximate confidence and trust item, ~~items~~ was observed to be similar to the order of influence of the aspects of care on the more distant satisfaction item~~items~~, with the exception that 'giving you enough time' was ranked second (results not shown).

The proximity of questions in presentation therefore did not appear to be a major determinant of their rank order of predictive influence.

Table 3 shows the odds ratios, derived from the logistic regression 'interaction' model, for the effect of a one point increase in each rating of the consultation on reporting definite confidence and trust in the doctor. The complete regression model, along with confidence intervals and the method of deriving the odds ratios shown in Table 3, is included as a web appendix. The rank order of the estimated odds ratios highlights the relative influence of the seven aspects of the consultation on reporting definite confidence and trust. The dominance of having problems taken seriously is evident throughout the rankings. The rank orders of the contribution of the seven inter-personal aspects of care were similar for men and women. However, non-white patients, particularly those in the oldest age group, accorded higher priority to being given enough time during the consultation than did white patients. A notable difference was observed for patients aged 35 or less, who accorded lower ranking to being involved in decisions regarding their care than did older patients.

Discussion

Summary of main findings

A substantial majority of GP patient survey respondents expressed definite confidence and trust in their GP. Patients' confidence and trust in the doctor increased with patient age, was similar for males and females, and was reported more frequently by those of white ethnicity. For all items relating to interpersonal aspects of the consultation, higher patient ratings were associated with an increased likelihood of reporting confidence and trust. Confidence and trust was most strongly associated with patients' perceptions of having their problems taken seriously.

There was no appreciable difference between men and women in respect of the relative importance of aspects of the consultation as potential predictors of confidence and trust in their doctor. However, we observed some differences between patients in different age and ethnic groups: As age increases, patients who report greater trust appear to particularly value being involved in decisions about their care; non-white patients, particularly those aged 65 or more, placed particular value on being given enough time during their consultations. The identification of some immutable patient characteristics associated with systematic variation in patient's confidence and trust provides the potential opportunity for targeting patient care in an informed way – for example by actively engaging older patients in decisions about their care.

Strengths and limitations of the study

We conducted a secondary analysis of data from a major national survey involving a large sample of patients. The inclusion and exclusion criteria and outcome measures were limited by using pre-determined data, however the data set was large and varied enough to answer the questions posed. No previous studies have investigated the interaction effects of patient characteristics and interpersonal aspects of the consultation on confidence and trust in such a large sample of patients in the UK.

The adjusted survey response rate was 42%, with younger patients, non-white patients, and those living in areas of socioeconomic deprivation being under-represented amongst respondents.[34] This under-representation was comparable to similar surveys conducted elsewhere in the world.[35-37] A study of key measures within the GP patient survey found no evidence of non-response bias.[32] Individuals with complete data differed from those with incomplete data. However, although statistically significant, these differences were small. We therefore recognise the potential for selection bias in our data, although believe that our results might reasonably reflect the wider UK population. The large actual numbers of completed responses, even in under-represented subgroups, were sufficient to make precise estimates of associations.

We noted that the order in which the aspects of the consultation were presented in the patient questionnaire matched the general rank order of the estimated odds ratios for the relative contribution of aspects of the consultation to reporting definite confidence and trust. Whilst the variation in this rank ordering amongst different patient subgroups, together with our results regarding the 'overall satisfaction' item suggest otherwise, it remains possible that question-ordering effects are important. Such effects could be tested in future by altering the item order.

We did not have access to detailed information about the doctors or practices being commented on, and are therefore unable to assess the contribution of these ~~factors~~ variables in determining confidence and trust. Similarly, although previous research has suggested that the objective ~~patient~~ health status of patients may be of importance,[6,38] detailed information was not available to us within this dataset. It was not possible to tell if patients were referring to their usual doctor when responding to questions regarding the 'last time you saw a doctor'. Conclusions therefore, could not be drawn about continuity of care. However, data relate to one particular doctor-patient interaction, allowing a focused interpretation of aspects of the consultation within that particular consultation.

The relationship between the concepts of confidence and trust has previously been explored, with a distinction between the two concepts being suggested, based on an individual's perception of the situation.[39] Luhmann's work proposes that where confidence exists within a relationship, alternatives may not be considered, outcomes judged 'inevitable', and, if confidence is disappointed, blame attributed externally. In contrast, Luhmann suggests that where trust characterises a relationship, choice may be inherent, variable outcomes accepted, and disappointment characterised by internal rather than external attribution of blame. In the context of healthcare, Luhmann suggests that familiarity (for example between doctor and patient) may be an important determinant of whether the relationship is characterised by trust or confidence. Developing these ideas, some researchers have suggested that patients' trust in health care practitioners may relate to interpersonal familiarity, and that patients' trust in healthcare systems is often greatest

where systems are long established and known to the individual patient.[40] In situations characterised by lack of familiarity, patients may simply have to exercise faith in an individual practitioner or in the healthcare system.[39]

The two concepts were, however, conflated in the wording of the General Practice Patient Survey: "Did you have confidence and trust in the doctor you saw?" We were therefore unable to distinguish between confidence and trust in our investigation. Complex systems, such as the primary health care system in the UK, have been considered by some to require the exercise of confidence and trust as a pre-requisite for effective engagement with, and use of, the system.[41,42]

Comparison with existing literature

The association of patients' ~~confidence and~~ trust with increasing age and with white ethnicity, has been previously reported.[6] Our findings add depth to the current literature by considering the moderating effect of age, gender and ethnicity on the relationship between interpersonal aspects of care reflected in a recent consultation, and patients' confidence and trust in the doctor.

Previous research has highlighted associations between patients' ~~confidence and~~ trust and several interpersonal aspects of the doctor-patient relationship within the consultation. This includes the importance to patients of effective communication,[18] a sense of partnership between doctor and patient,[43] and the patient's perception of being given enough time during the consultation.[44] However, our observation that a sense of shared decision making was a stronger determinant of reported confidence and trust amongst older patients is a new finding. This contrasts with previous literature which has suggested that older patients may prefer a focus on receiving information rather than on active participation.[45,46] One explanation might be that this reflects a changing culture in which older people have a greater awareness of available healthcare, through media coverage for example. They may therefore feel more willing to be involved in decisions about which they have a prior awareness. It may also reflect a more holistic approach by

doctors to support patients' involvement. The contributions of trust and of shared decision making in patients' evaluations of health services have previously been considered separately.[47] Our findings, although based on cross sectional data with acknowledged potential for bias, suggest these ~~factors~~ variables are related and their effect on patients' perceptions and evaluations of health services are likely to be confounded.

Implications for future research and clinical practice

A number of the determinants of confidence and trust in doctors reported in our study would benefit from further investigation using qualitative approaches, including further exploration of patient perceptions of their problems being taken seriously. Such approaches might be beneficial in informing patient centred primary health care delivery and planning.[48] Providing services that are responsive to the needs and aspirations of an ageing population,[49] in respect of confidence and trust, might involve doctors routinely engaging in shared decision making with older patients during consultations. Highlighting of these issues in relevant undergraduate and postgraduate educational and training fora might be appropriate.

We have shown that the interpersonal aspects of the consultation rated in the survey were strongly associated with reported confidence and trust in the doctor, the strongest association being with 'taking your problems seriously'. The relative contribution of other aspects of the consultation to reported confidence and trust varied with the age and ethnicity of the patient. Incorporating these findings in delivering routine care has the potential to support a patient-centred approach to care, tailored to the patient as an individual.

Ethics

The Central Office for Research Ethics Committee (COREC) advised that the survey does not require formal medical research ethical approval but it adheres to the Market Research Society code of ethics

Conflicts of interest

Nil

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Contributors

JEC was responsible for planning the study, drafting and finalising the manuscript. DRS critically revised the manuscript. MJR, GA and JEC interpreted the data and participated in critical review. MR also provided critical review. JLC was responsible for supervision, aided in interpretation of data and also critically revised the manuscript.

References

1. Mascarenhas, O., et al., *Hypothesized predictors of patient-physician trust and distrust in the elderly: implications for health and disease management.* Clinical Interventions in Ageing, 2006. **1**(2): p. 175-188.
2. Hall, M., et al., *Trust in Physicians and Medical Institutions: What Is It, Can It Be Measured, and Does It Matter?* The Milbank Quarterly, 2001. **79**(4): p. 613-639.
3. Peabody, F., *The Care of the Patient.* Journal of the American Medical Association, 1927. **88**: p. 877-882.
4. Ridd, M., et al., *The patient-doctor relationship: a synthesis of the qualitative literature on patients' perspectives.* British Journal of General Practice, 2009. **59**: p. 268-275.
5. Mechanic, D. and Meyer, S.*Concepts of trust among patients with serious illness.* Social Science & Medicine, 2000. **51**(5): p. 657-668.
6. Tarrant, C.S., Stokes, T. Baker, R., *Factors associated with patients' trust in their general practitioner: a cross-sectional survey.* British Journal of General Practice, 2003. **53**: p. 798-800.
7. Fugelli, P., *Trust - in general practice.* British Journal of General Practice, 2001. **51**: p. 575-579.
8. Meyer, SB., Ward, PR., Jiwa, M.. *Does prognosis and socioeconomic status impact on trust in physicians? Interviews with patients with coronary disease in South Australia.* BMJ Open, 2012; **2**: e001389. doi:10.1136/bmjopen-2012-001389
9. Platonova, E.A., *Understanding Patient Satisfaction, Trust, and Loyalty to Primary Care Physicians.* Medical Care Research and Review, 2008. **65**(6): p. 696-712.
10. Little, P., et al., *Observational study of effect of patient centredness and positive approach on outcomes of general practice consultations.* British Medical Journal, 2001. **323**: p. 908-911.
11. Thom, DH., et al., *Further validation and reliability testing of the trust in physicians scale*. Medical Care, 1999. **37**: p. 510-7.

12. Safran, DG., et al., *Linking Primary Care Performance to Outcomes of Care*. Journal of Family Practice, 1998. **47**(3): p. 213–20.
13. Fiscella, K., et al., *Patient trust: is it related to patient-centred behaviour of primary care physicians?* Medical Care, 2004. **42**(11): p. 1049-1055.
14. Thom, D., *Physician behaviors that predict patient trust.* Journal of Family Practice, 2001. **50**(4): p. 323-328.
15. Ogden, J., et al., *What's in a name? An experimental study of patients' views of the impact and function of a diagnosis.* Family Practice, 2003. **20**(3): p. 248-253.
16. Burkitt Wright, E., Holcombe, C., and Salmon, P.,*Doctors' communication of trust, care, and respect in breast cancer: qualitative study.* British Medical Journal, 2004. **328**. 864. doi: http://dx.doi.org/10.1136/bmj.38046.771308.7C
17. Edwards, A., et al., *Patient-based outcome results from a cluster randomized trial of shared decision making skill development and use of risk communication aids in general practice.* Family Practice, 2004. **21**(4): p. 347-354.
18. Ommen, O.T.,Holger, S.P.,Janssen, C., *The relationship between social support, shared decision-making and patient's trust in doctors: a cross-sectional survey of 2,197 inpatients using the Cologne Patient Questionnaire.* Int J Public Health, 2010. **56**(319-327).
19. Cohen, D., et al., *Resource effects of training general practitioners in risk communication skills and shared decision making competences.* Journal of Evaluation in Clinical Practice, 2004. **10**(3): p. 439-445.
20. Edwards, A. and Elwyn, G.,*Involving patients in decision making and communicating risk: A longitudinal evaluation of doctors' attitudes, and confidence during a randomized trial.* Journal of Evaluation in Clinical Practice, 2004. **10**(3): p. 431-437.
21. Freeman, G., et al., *Evolving general practice consultation in Britain: issues of length and context.* British Medical Journal, 2002. **324**: p. 880-882.
22. Mainous, A., et al., *Continuity of Care and Trust in One's Physician: Evidence From Primary Care in the United States and the United Kingdom.* Family Medicine, 2001. **33**(1): p. 22-27.

23. Pereira Gray, D., et al., *Towards a theory of continuity of care.* Journal of the Royal Society of Medicine, 2003. **96**: p. 160-166.
24. Tarrant, C., *Continuity and Trust in Primary Care: A Qualitative Study Informed by Game Theory.* Annals of Family Medicine, 2010. **8**(5): p. 440-446.
25. Cocksedge, S.G., Nugent, R., Kelly, G., Chew-Graham, C., *Holding relationships in primary care: a qualitative study of doctors' and patients' perceptions.* British Journal of General Practice, 2011. **61**(568):e484-91. doi 10.3399/bjgp11X588457.
26. Kao, A., et al., *Patients' Trust in Their Physicians. Effects of Choice, Continuity, and Payment Method.* Journal of General Internal Medicine, 1999. **13**: p. 681-686.
27. Chu-Weininger, M., and Balkrishnan, R.,*Consumer satisfaction with primary care provider choice and associated trust.* BioMed Central Health Services Research, 2006. **6**: p. 139-152.
28. Staiger, T., et al., *Brief Report: Patient-Physician Agreement as a Predictor of Outcomes in Patients with Back Pain.* Journal of General Internal Medicine, 2005. **20**: p. 935-937.
29. Krupat, E., et al., *When Physicians and Patients Think Alike: Patient-Centred Beliefs and Their Impact on Satisfaction and Trust.* Family Practice, 2001. **50**(12): p. 1057-1062.
30. Tarn, D., et al., *Trust in One's Physician: The Role of Ethnic Match, Autonomy, Acculturation, and Religiosity Among Japanese and Japanese Americans.* Annals of Family Medicine, 2005. **3**(4): p. 339-347.
31. McKinstry, B. and Wang, J.X.,*Putting on the style: what patients think of the way their doctor dresses.* British Journal of General Practice, 1991. **41**: p. 275-278.
32. Campbell, J., et al., *Development of the national GP Patient Survey for use in primary care in the National HealthService in the UK.* BMC Family Practice, 2009. **10**(57).doi:10.1186/1471-2296-10-57
33. Roland, M., et al., *Reliability of patient responses in pay for performance schemes: analysis of national General Practitioner Patient Survey data in England.* British Medical Journal, 2009. **339**(7727): p. 955.

34. Department of communities and local government. *The English indices of deprivation* [internet] 2007. (Updated; cited 16 July 2012). Available from: http://www.communities.gov.uk/documents/communities/pdf/576659.pdf

35. Elliott MN, Edwards C, Angeles J, Hays RD. *Patterns of unit and item nonresponse in the CAHPS hospital survey.* Health Serv Res 2005;**40**:2096-119

36. Kahn KL, Honhiu L, Adams JL, Chen WP, Tisnado DN, Carlisle DM, et al. *Methodological challenges associated with patient responses to follow-up longitudinal surveys regarding quality of care.* Health Serv Res 2003;**38**:1579-98

37. Angus VC, Entwistle VA, Emslie MJ, Walker KA, Andrew JE. *The requirement for prior consent to participate on survey response rates: a population-based survey in Grampian.* BMC Health Serv Res 2003;**3**:21

38. Thorne, SE., Robinson, CA., *Guarded alliance: health care relationships in chronic disease.* Image J Nurse Sch, 1989. 21(3): p. 153-7.

39. Luhmann, N., *Familiarity, confidence, trust: Problems and alternatives*, in Gambetta, Diego (ed.) Trust: Making and breaking cooperative relations,electronic edition, Department of Sociology, University of Oxford, 2000; chapter 6, 94-107. [Accessed 26th March 2013]. http://www.sociology.ox.ac.uk/papers/luhmann94-107.pdf

40. Gidman, W., Ward., P., McGregor, L., *Understanding public trust in services provided by community pharmacists relative to those provided by general practitioners: a qualitative study.* BMJ Open, 2012; **2**: e000939. doi:10.1136/bmjopen-2012-000939

41. Jalava, J., *From Norms to Trust. The Luhmannian connections between trust and system*, European Journal or Social Theory, 2003; **6**(2): p.173-190

42. Dibben, MR., Davies, HTO., *Trustworthy doctors in confidence building systems.* Qual Saf Health Care, 2004: **13**(2). p. 88-89.

43. Little, P., et al., *Preferences of patients for patient centred approach to consultation in primary care: observational study.* British Medical Journal, 2001. **322**: p. 1-7.

44. Skirbekk, H.M., Hjortdahl, AL., Per., Arnstein, F.,*Mandates of Trust in the Doctor-Patient Relationship.* Qualitative Health Research, 2011. **21**(9): p. 1182-1190.

45. Bastiaens, H.V.R., Pavlic, P., Raposo, DR., Baker, R., *Older people's preferences for involvement in their own care: a qualitative study in primary health care in 11 European countries.* Patient Educ Couns, 2007. **68**(1): p. 33-42.

46. Levinson, W.K., Kuby, A., Thisted, RA., *Not all patients want to participate in decision making. A national study of public preferences.* J Gen Intern Med, 2005. **20**(6): p. 531-5.

47. Joffe, S., et al., *What do patients value in their hospital care? An empirical perspective on autonomy centred bioethics.* Journal of Medical Ethics, 2003. **29**: p. 103-108.

48. Calnan, M.w., Sanford, E., *Public trust in health care: the system or the doctor?* Qual Saf Health Care, 2004. **13**: p. 92-97.

49. UK National Statistics. *Topic guide to: Older People* [internet] 2012. (Updated 1 Sep 2012; cited 9 Jan 2012). Available from: http://www.statistics.gov.uk/hub/population/ageing/older-people

Table1.Sociodemographic profile of analysis sample and percentage of each subgroup reporting no confidence, partial confidence or definite confidence and trust in the doctor.

Subgroup	N	% of sample	Did you have confidence and trust in the doctor you saw? No not at all (% of subgroup)	Yes to some extent (% of subgroup)	Yes definitely (% of subgroup)
Gender					
Male	651,163	44	3	23	74
Female	825,089	56	4	24	73
Age (years)					
18-24	70,435	5	7	34	60
25-34	157,753	11	7	33	60
35-44	234,768	16	5	27	68
45-54	274,851	19	4	25	71
55-64	314,986	21	3	22	76
65-74	246,692	17	1	17	81
75-84	140,851	10	1	16	83
85and over	35,916	2	1	16	82
Ethnic group					
White	1,279,862	87	3	22	75
Mixed	10,069	1	6	31	63
Asian / Asian British	79,512	5	6	35	59
Black / Black British	38,131	3	4	30	65
Chinese	6,657	<1	6	43	51
Other	62,021	4	7	32	62
Perceived hHealth status					
Poor	86,597	6	6	23	71
Fair	293,071	20	4	26	70
Good	537,337	36	3	26	71
Very good	429,332	29	3	22	76
Excellent	129.925	9	3	16	82
Locality					
Non-inner city	281,949	19	2	19	79
Inner city	1,194,303	81	4	25	72
Deprivation					
Lowest	267,414	18	2	21	77
Next lowest	291,191	20	3	21	76
Middle	296,938	20	3	23	74
Next highest	298,096	20	4	25	71
Highest	322,613	22	5	26	69
All	1,476,252	100	3	24	73

Table 2. Odds ratios (95% confidence interval) for the 'main effects' binary logistic regression model predicting definite confidence and trust in the doctor.

	Odds Ratio	(95% CI)
Ratings of last consultation		
Q20a Giving you enough time	1.19	(1.18, 1.21)
Q20b Asking about your symptoms	1.26	(1.24, 1.28)
Q20c Listening to you	1.38	(1.36, 1.40)
Q20d Explaining tests and treatments	1.56	(1.55, 1.58)
Q20e Involving you in decisions about your care	1.51	(1.49, 1.52)
Q20f Treating you with care and concern	1.60	(1.57, 1.62)
Q20g Taking your problems seriously	2.86	(2.82, 2.89)
Patient sociodemographic ~~factors~~variables		
Female (ref Male)	0.90	(0.89, 0.91)
Age35-64 years (ref age <35 years)	1.27	(1.25, 1.29)
Age65 years &over (ref age <35 years)	1.60	(1.58, 1.63)
Non-white ethnic group (ref White)	0.89	(0.88, 0.91)
Perceived h~~H~~ealth status	1.12	(1.12, 1.13)
Inner city setting (ref non-inner city setting)	0.95	(0.93, 0.96)
Deprivation	0.98	(0.98, 0.99)

Table 3. Odds ratios for the effect of a one point increase in patient ratings of interpersonal aspects of the consultation on the odds of having definite confidence and trust in the doctor, by patient age, gender and ethnicity. The odds ratios within each patient subgroup are ranked in the lower half of the table.

			age<35				age35-64				age65+			
			White		Non-White		White		Non-White		White		Non-White	
	Consultation aspects	All patients*	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Odds Ratios	Giving you enough time	1.19	1.17	1.11	1.38	1.31	1.15	1.09	1.36	1.29	1.33	1.26	1.56	1.48
	Asking about your symptoms	1.26	1.25	1.25	1.14	1.14	1.28	1.27	1.17	1.16	1.31	1.30	1.19	1.19
	Listening to you	1.38	1.42	1.41	1.30	1.30	1.41	1.40	1.29	1.29	1.35	1.35	1.24	1.24
	Explaining tests and treatments	1.56	1.55	1.56	1.38	1.39	1.61	1.62	1.44	1.45	1.56	1.56	1.39	1.40
	Involving you in decisions about your care	1.51	1.38	1.38	1.25	1.25	1.56	1.56	1.42	1.42	1.58	1.58	1.43	1.44
	Treating you with care and concern	1.60	1.59	1.58	1.60	1.59	1.61	1.60	1.63	1.62	1.56	1.55	1.58	1.57
	Taking your problems seriously	2.86	2.64	2.78	2.25	2.37	2.95	3.11	2.51	2.64	2.89	3.04	2.45	2.58
Rank of Importance **	Giving you enough time	7	7	7	4	4	7	7	5	5	6	7	3	3
	Asking about your symptoms	6	6	6	7	7	6	6	7	7	7	6	7	7
	Listening to you	5	4	4	5	5	5	5	6	6	5	5	6	6
	Explaining tests and treatments	3	3	3	3	3	2	2	3	3	4	3	5	5
	Involving you in decisions about your care	4	5	5	6	6	4	4	4	4	2	2	4	4
	Treating you with care and concern	2	2	2	2	2	3	3	2	2	3	4	2	2
	Taking your problems seriously	1	1	1	1	1	1	1	1	1	1	1	1	1

* Odds ratios taken from table 2

** 1 = most influential, 7 = least influential

Table A1: Odds ratios (95% confidence interval) for a binary logistic regression model predicting definite confidence and trust in the doctor and which includes interactions between age, gender and ethnicity and patients' ratings of interpersonal aspects of the consultation.

	Odds Ratio	(95% CI)
Ratings of last consultation		
Q20a Giving you enough time	1.17	(1.14, 1.21)
Q20b Asking about your symptoms	1.25	(1.21, 1.30)
Q20c Listening to you	1.42	(1.37, 1.47)
Q20d Explaining tests and treatments	1.55	(1.50, 1.60)
Q20e Involving you in decisions about your care	1.38	(1.34, 1.42)
Q20f Treating you with care and concern	1.59	(1.53, 1.64)
Q20g Taking your problems seriously	2.64	(2.56, 2.73)
Patient sociodemographic factors		
Female	0.90	(0.88, 0.92)
Age35-64	1.69	(1.64, 1.74)
Age65&over	2.17	(2.10, 2.25)
Non-white ethnic group	0.62	(0.60, 0.64)
Perceived h~~H~~ealth status	1.12	(1.12, 1.13)
Innercity area	0.95	(0.93, 0.96)
Deprivation	0.98	(0.98, 0.99)
Interaction terms		
Female*Q20a	0.95	(0.93, 0.97)
Female*Q20b	0.99	(0.97, 1.02)
Female*Q20c	1.00	(0.97, 1.02)
Female*Q20d	1.01	(0.98, 1.03)
Female*Q20e	1.00	(0.98, 1.02)
Female*Q20f	0.99	(0.97, 1.02)
Female*Q20g	1.05	(1.03, 1.08)
age35_64*Q20a	0.98	(0.96, 1.01)
age35_64*Q20b	1.02	(0.98, 1.06)
age35_64*Q20c	0.99	(0.96, 1.03)
age35_64*Q20d	1.04	(1.01, 1.07)
age35_64*Q20e	1.14	(1.10, 1.17)
age35_64*Q20f	1.02	(0.98, 1.05)
age35_64*Q20g	1.12	(1.08, 1.15)
age65_over*20a	1.13	(1.10, 1.17)
age65_over*20b	1.04	(1.00, 1.09)
age65_over*20c	0.95	(0.92, 1.00)
age65_over*20d	1.00	(0.97, 1.04)
age65_over*20e	1.15	(1.11, 1.19)
age65_over*20f	0.98	(0.94, 1.03)
age65_over*20g	1.09	(1.05, 1.14)
Non-white*Q20a	1.17	(1.14, 1.21)
Non-white*Q20b	0.91	(0.88, 0.95)
Non-white*Q20c	0.92	(0.88, 0.95)
Non-white*Q20d	0.89	(0.87, 0.92)
Non-white*Q20e	0.91	(0.88, 0.93)
Non-white*Q20f	1.01	(0.97, 1.05)
Non-white*Q20g	0.85	(0.82, 0.88)

Note: Although some interaction terms are not significant at the 5% level (i.e. the 95% confidence interval contains 1.00) each block of seven interaction terms (addressing two age group effects, gender and ethnicity related interactions) was found to contribute significantly to the model (likelihood ratio tests, $p<0.0001$ for each block).

Calculation of the odds ratios given in Table A2 and in Table 3 of the main paper

Table A1 was used to construct the odds ratios shown in Table A2 below and in Table 3 of the main paper. For example, the odds ratio for the effect of a one point increase in the rating of "Q20c Listening to you" for a non-white male patient in the 35-64 years age group was found by first identifying in Table A1 the values 1.42, 0.99 and 0.92 which are the respective odds ratios associated with that particular aspect of the consultation for male patients in the 35-64 years age group from a non-white ethnic background. The odds ratio is then calculated as $1.42 \times 0.99 \times 0.92 = 1.29$ as shown in the relevant cell of Table A2 below and in Table 3 in the main paper. The calculations were performed using the 'lincom' command in Stata, which also gave 95% confidence intervals for the odds ratios (Table A2).

Table A2: Odds ratio (95% confidence interval) [rank within patient subgroup] for the effect of a one point increase in patient ratings of interpersonal aspects of the consultation on the odds of having definite confidence and trust in the doctor, by patient age, gender and ethnicity.

	White		Non-white	
Age group: 18-34 years	Male	Female	Male	Female
Q20a Giving you enough time	1.17 (1.14, 1.21) [7]	1.11 (1.08, 1.14) [7]	1.38 (1.33, 1.43) [4]	1.31 (1.27, 1.35) [4]
Q20b Asking about your symptoms	1.25 (1.21, 1.30) [6]	1.25 (1.21, 1.29) [6]	1.14 (1.10, 1.19) [7]	1.14 (1.09, 1.18) [7]
Q20c Listening to you	1.42 (1.37, 1.47) [4]	1.41 (1.37, 1.46) [4]	1.30 (1.25, 1.36) [5]	1.30 (1.24, 1.35) [5]
Q20d Explaining tests and treatments	1.55 (1.50, 1.60) [3]	1.56 (1.52, 1.60) [3]	1.38 (1.34, 1.43) [3]	1.39 (1.35, 1.44) [3]
Q20e Involving you in decisions about your care	1.38 (1.34, 1.42) [5]	1.38 (1.34, 1.42) [5]	1.25 (1.21, 1.29) [6]	1.25 (1.21, 1.29) [6]
Q20f Treating you with care and concern	1.59 (1.53, 1.64) [2]	1.58 (1.52, 1.63) [2]	1.60 (1.53, 1.67) [2]	1.59 (1.53, 1.66) [2]
Q20g Taking your problems seriously	2.64 (2.56, 2.73) [1]	2.78 (2.70, 2.87) [1]	2.25 (2.17, 2.33) [1]	2.37 (2.29, 2.45) [1]
Age group: 35-64 years				
Q20a Giving you enough time	1.15 (1.13, 1.18) [7]	1.09 (1.07, 1.12) [7]	1.36 (1.31, 1.40) [5]	1.29 (1.25, 1.33) [5]
Q20b Asking about your symptoms	1.28 (1.25, 1.31) [6]	1.27 (1.24, 1.30) [6]	1.17 (1.12, 1.21) [7]	1.16 (1.12, 1.21) [7]
Q20c Listening to you	1.41 (1.37, 1.44) [5]	1.40 (1.37, 1.44) [5]	1.29 (1.24, 1.34) [6]	1.29 (1.24, 1.33) [6]
Q20d Explaining tests and treatments	1.61 (1.58, 1.65) [2]	1.62 (1.59, 1.65) [2]	1.44 (1.40, 1.49) [3]	1.45 (1.41, 1.50) [3]
Q20e Involving you in decisions about your care	1.56 (1.53, 1.59) [4]	1.56 (1.54, 1.60) [4]	1.42 (1.37, 1.46) [4]	1.42 (1.38, 1.46) [4]
Q20f Treating you with care and concern	1.61 (1.57, 1.65) [3]	1.60 (1.56, 1.64) [3]	1.63 (1.56, 1.69) [2]	1.62 (1.56, 1.68) [2]
Q20g Taking your problems seriously	2.95 (2.88, 3.02) [1]	3.11 (3.04, 3.18) [1]	2.51 (2.43, 2.59) [1]	2.64 (2.55, 2.73) [1]
Age group: 64 years and over				
Q20a Giving you enough time	1.33 (1.30, 1.37) [6]	1.26 (1.23, 1.30) [7]	1.56 (1.51, 1.62) [3]	1.48 (1.43, 1.54) [3]
Q20b Asking about your symptoms	1.31 (1.27, 1.35) [7]	1.30 (1.26, 1.34) [6]	1.19 (1.14, 1.25) [7]	1.19 (1.13, 1.24) [7]
Q20c Listening to you	1.35 (1.31, 1.40) [5]	1.35 (1.31, 1.39) [5]	1.24 (1.19, 1.30) [6]	1.24 (1.18, 1.30) [6]
Q20d Explaining tests and treatments	1.56 (1.51, 1.60) [4]	1.56 (1.52, 1.61) [3]	1.39 (1.34, 1.45) [5]	1.40 (1.35, 1.45) [5]
Q20e Involving you in decisions about your care	1.58 (1.54, 1.62) [2]	1.58 (1.54, 1.63) [2]	1.43 (1.38, 1.49) [4]	1.44 (1.38, 1.49) [4]
Q20f Treating you with care and concern	1.56 (1.51, 1.62) [3]	1.55 (1.50, 1.60) [4]	1.58 (1.50, 1.65) [2]	1.57 (1.49, 1.64) [2]
Q20g Taking your problems seriously	2.89 (2.80, 2.98) [1]	3.04 (2.94, 3.13) [1]	2.45 (2.35, 2.56) [1]	2.58 (2.48, 2.69) [1]

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	5-6
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	6-8
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6-7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-8
Bias	9	Describe any efforts to address potential sources of bias	7-8
Study size	10	Explain how the study size was arrived at	8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6-8
		(*b*) Describe any methods used to examine subgroups and interactions	7-8
		(*c*) Explain how missing data were addressed	6-8
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	6-8
		(*e*) Describe any sensitivity analyses	7-8
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	8
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	8
Outcome data	15*	Report numbers of outcome events or summary measures	9
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	9
		(*b*) Report category boundaries when continuous variables were categorized	9
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	9-10
Discussion			
Key results	18	Summarise key results with reference to study objectives	10-11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	11-12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	12-13
Generalisability	21	Discuss the generalisability (external validity) of the study results	12-13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	14

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.